

**To:** Bybee, Darcy[darcy.bybee@dnr.mo.gov]  
**From:** Casburn, Tracey  
**Sent:** Wed 12/21/2016 8:39:02 PM  
**Subject:** FW: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

Okay. Change of local opinion.

MDNR has met the DRR requirement for the submittal deadline. However, we encourage any updates to be submitted as soon as possible so that it can be used for consideration in the 2017 designations.

I am going to reschedule the meeting to make sure that we have the right folks in the room.

Tracey

**From:** Casburn, Tracey  
**Sent:** Wednesday, December 21, 2016 1:51 PM  
**To:** 'Bybee, Darcy' <darcy.bybee@dnr.mo.gov>  
**Subject:** RE: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

Okay. Thank you, Darcy.

Current opinion is that even a change to the submittal would need to be received by January 13 so I thought that it would be better to nail issues like that down as soon as possible.

Tracey

-----Original Appointment-----

**From:** Bybee, Darcy [<mailto:darcy.bybee@dnr.mo.gov>]  
**Sent:** Wednesday, December 21, 2016 1:49 PM



**To:** Casburn, Tracey

**Cc:** Wilbur, Emily; Keas, Ashley

**Subject:** Tentative: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

**When:** Wednesday, December 28, 2016 9:00 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).

**Where:** R7-RO2.3-L08-12/R7-RO

Tracey,

I am out of the office next week, but as long as Emily and Ashley are available, please don't let me delay the discussion...

Happy Holidays and we'll talk in 2017!

Thanks,

Darcy



**To:** Wiese, Carrie[carrie.wiese@nebraska.gov]  
**Cc:** Crable, Gregory[Crable.Gregory@epa.gov]; Algae-Eakin, Amy[Algae-Eakin.Amy@epa.gov]; Casburn, Tracey[casburn.tracey@epa.gov]  
**From:** Peter, David  
**Sent:** Thur 10/6/2016 1:51:11 PM  
**Subject:** RE: Round 3 SO2 Designation Memo

Good morning Carrie,

I don't think that we have ever really discussed SO2 from a big picture standpoint. The CD designation "rounds" are mostly based on the consent decree with the Sierra Club. Information gathered as part of the DRR will generally be used in rounds 3 and 4. Below I have described Nebraska's 1-hr SO2 designations status as I believe it to be. As you will see, it gets a little complicated so let me know if you have any questions or believe I have something incorrect.

**Round 1 – Designate areas with a violating monitor for the period 2009-2011 (None)**

29 nonattainment designations were made across the US in August 2013. No areas in Nebraska were designated nonattainment in August 2013.

**Round 2 – Per the consent decree, designate areas around sources that emitted more than 16,000 tons or 2,600 tons with an annual average emission rate of at least 0.45 lb/mmBtu in 2012 by July 1, 2016 (Gerald Gentleman, Nebraska City and Sheldon Station)**

Three sources met this criteria – Gerald Gentleman, Sheldon Station and Nebraska City. All three areas were designated by July 1, 2016 – the areas around Gerald Gentleman and Nebraska City were designated "unclassifiable/attainment" and the area around Sheldon Station was designated "unclassifiable".

**Round 3 – Per the consent decree, designate the remaining areas of the US for which new monitoring will be not be conducted by December 31, 2017 (Gerald Whelan and all areas in Nebraska except the areas around Gerald Gentleman, Nebraska City, Sheldon Station and North Omaha)**



Nebraska is planning on monitoring the areas around Sheldon Station and North Omaha to comply with the DRR. The area around Sheldon Station was technically designated in July 2016, so no further designation is required. The area around North Omaha has not been designated and will therefore be designated in round 4. The areas around Gerald Gentleman and Nebraska City were designated in July 2016 and therefore are not included in the round 3 or any future designations.

Therefore, EPA intends to designate the rest of the Nebraska by December 31, 2017. The Gerald Whelan station is subject to the DRR and is not monitoring. Therefore the area around Gerald Whelan will be designated in this round. We will also be designating areas in Nebraska that are not subject to the DRR (areas where there were no sources that emitted more than 2,000 tons in 2015) in this round. EPA will be providing more information on these areas.

As a side note, Sheldon Station is subject to the DRR since the facility emitted more than 2,000 tons in year 2015. Nebraska has elected to monitor the area around Sheldon Station to comply with the DRR. Although the area has already been designated, the information obtained from this DRR monitoring activity could be used in a redesignation process.

**Round 4 – Per the consent decree, designate areas for which new monitors were installed by December 31, 2020 (North Omaha)**

As noted, the only area that has not been designated for which a new monitor is being installed is the area around North Omaha.

**Other DRR Notes and DRR Ongoing requirements (40 CFR 51.1205)**

Gerald Gentleman and Nebraska City are subject to the DRR. However since EPA found the modeling submitted by Nebraska to be adequate to designate the areas “unclassifiable/attainment” in July 2016, EPA does not expect to receive any additional modeling for these 2 sources as part of the DRR. However, these 2 facilities are subject to the DRR ongoing requirements since these facilities were modeled at their actual emissions for the calendar years 2012-2014.



David Peter

Environmental Engineer

U.S. EPA Region 7, Air Permitting Branch

11201 Renner Boulevard

Lenexa, KS 66219

913-551-7397

**From:** Wiese, Carrie [<mailto:carrie.wiese@nebraska.gov>]

**Sent:** Wednesday, October 05, 2016 3:37 PM

**To:** Peter, David <[peter.david@epa.gov](mailto:peter.david@epa.gov)>

**Subject:** RE: Round 3 SO2 Designation Memo

Hi David,

I was going back through some old messages and came across this. Does Nebraska have any Round 3 sources?

Thanks,  
Carrie

**From:** Peter, David [<mailto:peter.david@epa.gov>]

**Sent:** Monday, July 25, 2016 9:30 AM

**To:** Wiese, Carrie; Wharton, Tracy; Douglas Watson; [ideahl@kdheks.gov](mailto:ideahl@kdheks.gov); Bybee, Darcy; Wilbur, Emily; Johnson, Matthew [DNR]; McGraw, Jim [DNR]

**Cc:** Algoe-Eakin, Amy

**Subject:** Round 3 SO2 Designation Memo



All,

I am sending you a memo related to the Round 3 designation process. Let me know if you have any questions.

David Peter

Environmental Engineer

U.S. EPA Region 7, Air Permitting Branch

11201 Renner Boulevard

Lenexa, KS 66219

913-551-7397



**From:** Casburn, Tracey  
**Location:** R7-RO2.3-L08-12/R7-RO; R7-Conflin-Ex. 6 - Personal Privacy-P10XXXX/Phone/R7-RO  
**Importance:** Normal  
**Subject:** Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data  
**Start Date/Time:** Tue 1/10/2017 8:30:00 PM  
**End Date/Time:** Tue 1/10/2017 9:30:00 PM



**To:** Wilbur, Emily[emily.wilbur@dnr.mo.gov]  
**From:** Casburn, Tracey  
**Sent:** Tue 12/27/2016 3:59:41 PM  
**Subject:** RE: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

Okay. I rescheduled it for January 10 at 230.

**From:** Wilbur, Emily [mailto:emily.wilbur@dnr.mo.gov]  
**Sent:** Tuesday, December 27, 2016 9:05 AM  
**To:** Casburn, Tracey <casburn.tracey@epa.gov>  
**Subject:** FW: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

Hi Tracey!

We just received the official announcement that our office will be closed on Jan. 9 because of inauguration activities in Jefferson City. We will need to reschedule the DRR call, if possible. It looks like the following dates/times are open on our calendars here:

Tuesday, Jan. 10 2:30-3:30

Wednesday, Jan 11 1:00-2:00

Friday, Jan 13 all day

Hope one of these times works for you guys as well. I'm back in the office this week (Darcy's out the entire week), if you need anything.

Thanks!

Emily

**From:** Bybee, Darcy



**Sent:** Wednesday, December 21, 2016 3:12 PM  
**To:** Keas, Ashley; Wilbur, Emily  
**Subject:** FW: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

FYI

Thanks,

Darcy

**From:** Casburn, Tracey [<mailto:casburn.tracey@epa.gov>]  
**Sent:** Wednesday, December 21, 2016 3:06 PM  
**To:** Bybee, Darcy  
**Subject:** RE: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

Ok. Keep me posted.

-----Original Appointment-----

**From:** Bybee, Darcy [<mailto:darcy.bybee@dnr.mo.gov>]  
**Sent:** Wednesday, December 21, 2016 3:04 PM  
**To:** Casburn, Tracey  
**Subject:** Accepted: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data  
**When:** Monday, January 09, 2017 12:00 PM-1:00 PM (UTC-06:00) Central Time (US & Canada).  
**Where:** R7-RO2.3-L08-12/R7-RO

Tracey—

I accepted this then thought about it. There is a chance that our offices may be closed on this day. They are not currently, however this is Inauguration Day in Missouri. Historically, Jefferson City state offices are closed. We should know more soon. If we are in the office, this should work just fine!

Thanks,

Darcy



**From:** Casburn, Tracey  
**Location:** R7-RO2.3-L08-12/R7-RO  
**Importance:** Normal  
**Subject:** Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data  
**Start Date/Time:** Tue 1/10/2017 8:30:00 PM  
**End Date/Time:** Tue 1/10/2017 9:30:00 PM



**To:** Bybee, Darcy[darcy.bybee@dnr.mo.gov]  
**From:** Casburn, Tracey  
**Sent:** Wed 12/21/2016 9:06:27 PM  
**Subject:** RE: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

Ok. Keep me posted.

-----Original Appointment-----

**From:** Bybee, Darcy [mailto:darcy.bybee@dnr.mo.gov]  
**Sent:** Wednesday, December 21, 2016 3:04 PM  
**To:** Casburn, Tracey  
**Subject:** Accepted: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data  
**When:** Monday, January 09, 2017 12:00 PM-1:00 PM (UTC-06:00) Central Time (US & Canada).  
**Where:** R7-RO2.3-L08-12/R7-RO

Tracey—

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Thanks,

Darcy



**From:** Casburn, Tracey  
**Location:** R7-RO2.3-L08-12/R7-RO  
**Importance:** Normal  
**Subject:** Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data  
**Start Date/Time:** Mon 1/9/2017 6:00:00 PM  
**End Date/Time:** Mon 1/9/2017 7:00:00 PM



**To:** Bybee, Darcy[darcy.bybee@dnr.mo.gov]  
**From:** Casburn, Tracey  
**Sent:** Wed 12/21/2016 7:50:57 PM  
**Subject:** RE: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data

Okay. Thank you, Darcy.

Current opinion is that even a change to the submittal would need to be received by January 13 so I thought that it would be better to nail issues like that down as soon as possible.

Tracey

-----Original Appointment-----

**From:** Bybee, Darcy [mailto:darcy.bybee@dnr.mo.gov]  
**Sent:** Wednesday, December 21, 2016 1:49 PM  
**To:** Casburn, Tracey  
**Cc:** Wilbur, Emily; Keas, Ashley  
**Subject:** Tentative: Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data  
**When:** Wednesday, December 28, 2016 9:00 AM-10:00 AM (UTC-06:00) Central Time (US & Canada).  
**Where:** R7-RO2.3-L08-12/R7-RO

Tracey,

I am out of the office next week, but as long as Emily and Ashley are available, please don't let me delay the discussion...

Happy Holidays and we'll talk in 2017!

Thanks,

Darcy



**From:** Casburn, Tracey  
**Location:** R7-RO2.3-L08-12/R7-RO  
**Importance:** Normal  
**Subject:** Talk about path forward for SO2 DRR modeling submitted based on 2015 CEMS data  
**Start Date/Time:** Wed 12/28/2016 3:00:00 PM  
**End Date/Time:** Wed 12/28/2016 4:00:00 PM



## **MDNR APCP and EPA R7 APDB Quarterly Coordination Meeting**

**December 16, 2016**

**10 a.m. – 3 p.m.**

**Location:** Missouri Department of Conservation, Sedalia, MO, (660) 530-5500  
2000 South Limit Avenue, Sedalia, MO 65301

**Objective:** Ensure effective communication, coordination and issue resolution between Region 7 and MDNR

### **Attendees:**

R7: Mike Jay, Tracey Casburn, Amy Algae-Eakin, Amy Bhesania

Calling in: EPA Staff

MDNR: Kyra Moore, Darcy Bybee, Steve Hall, Emily Wilbur, Wayne Graf

Calling in: N/A

## **Agenda**

<u>Time</u>	<u>Topic</u>	<u>Lead</u>
10:00 – 10:15	<b>General updates</b> <ul style="list-style-type: none"><li>• Acknowledgement of recent accomplishments</li><li>• Staffing, fiscal or general program issues impacting success for MDNR or R7</li></ul>	Mike/Kyra
10:15 – 10:45	<b>Rules and SIPs (a snapshot in time)</b> <ul style="list-style-type: none"><li>• purpose and functions over time</li></ul>	Mike/Darcy
10:45 – 11:00	<b>Ozone</b> <ul style="list-style-type: none"><li>• 2008 standard – EPA update on timing of redesignation</li><li>• 2015 standard – EPA update on status of MO's boundary recommendations</li></ul>	Mike/Darcy
11:00 – 11:30	<b>SO2</b> <ul style="list-style-type: none"><li>• Initial round NAAs<ul style="list-style-type: none"><li>○ redesignation of Jefferson County</li><li>○ approval status of Jackson County NAA plan</li><li>○ approval status of 6.261 rule</li></ul></li><li>• CD round – EPA update on status of petitions,</li></ul>	Tracy/Emily



	<p>timeline?</p> <ul style="list-style-type: none"> <li>• DRR modeling round – timeline discussion</li> <li>• DRR monitoring round – AMNP and monitor status update</li> </ul>	
11:30 – 12:00	<p><b>Rules</b></p> <ul style="list-style-type: none"> <li>• Federal IBR updates (6.070, 75 &amp; 80): currently open for public comment</li> <li>• Periodic rule review comments/draft responses</li> <li>• CAIR rescissions draft demo</li> <li>• CSAPR final rule updates</li> <li>• PM2.5 NNSR precursors starting April 2017</li> </ul>	Tracey
12:00 – 1:00	<b>Lunch</b>	
1:00 – 2:00	<p><b>Rules Continued</b> <b>Other EPA updates</b></p> <ul style="list-style-type: none"> <li>• SIP approval schedule – ISIPs in the queue</li> <li>• Regional Haze – status of final rules and guidance, MO's timeline, start R7/FLM coordination</li> <li>• Buick (lead and SO2)—EPA update?</li> <li>• PM2.5 Guidance/Precursor Analysis – non-point ammonia inventory updates developments and their effects on our maintenance plan vs. doing a precursor analysis</li> </ul>	Tracey/ Wayne
2:00 – 2:30	<p><b>Administrative topics</b></p> <ul style="list-style-type: none"> <li>• How does EPA want to receive our information (i.e. boundary recommendations, 111d, or other items not covered by the regional consistency memo)?</li> <li>• We are updating many of our webpages. If you are using our site for a specific purpose, please let me know.</li> <li>• The Department has a new Proposed Rules (and Rules in Development) webpage that contains information for all regulatory programs. <a href="https://dnr.mo.gov/proposed-rules">https://dnr.mo.gov/proposed-rules</a>. Let us know if you would like help navigating around the page.</li> </ul>	Mike/Darcy
2:30 – 2:45	<b>Wrap-up</b>	Tracey



**To:** Crable, Gregory[Crable.Gregory@epa.gov]  
**Cc:** Wiese, Carrie[carrie.wiese@nebraska.gov]  
**From:** Wharton, Tracy  
**Sent:** Fri 6/10/2016 4:05:35 PM  
**Subject:** Question about SO2 letter due 1 July 16

Greg,

Hi – hope your week has gone well. To whom should our SO2 letter (for the facilities that need to be monitored/modeled as per DRR) be addressed, and who should be courtesy-copied?

Thank you and have a great weekend!

Tracy

Tracy Wharton

NAAQS-SIP Coordinator, Grants, Planning, and Outreach Unit, Air Quality Division

Nebraska Department of Environmental Quality (NDEQ)

1200 N Street, The Atrium, Suite 400

PO Box 98922, Lincoln, NE 68509-8922

Phone: (402) 471-6410

[tracy.wharton@nebraska.gov](mailto:tracy.wharton@nebraska.gov)



**To:** 'Wharton, Tracy'[tracy.wharton@nebraska.gov]  
**From:** Crable, Gregory  
**Sent:** Wed 12/21/2016 2:49:25 PM  
**Subject:** RE: Question about SO2 DRR

Sure can

**From:** Wharton, Tracy [mailto:tracy.wharton@nebraska.gov]  
**Sent:** Wednesday, December 21, 2016 8:38 AM  
**To:** Crable, Gregory <Crable.Gregory@epa.gov>  
**Subject:** FW: Question about SO2 DRR

Hi, Greg – I hadn't heard back from you yet on this...can we discuss during today's call?

Tracy

**From:** Wharton, Tracy  
**Sent:** Wednesday, December 14, 2016 9:46 AM  
**To:** 'Crable, Gregory'  
**Subject:** Question about SO2 DRR

Greg,

Hi, Greg – I hope you are having a good week so far and staying warm! I had a quick question...

Yesterday on the NACAA Criteria Pollutants call they were covering the upcoming deadlines for the DRR and, provided I heard this correctly, that states should notify EPA that new monitors were up and running (as of 1 Jan 2017) by the same deadline given for submitting modeling analyses, which is 13 January. I was unable to find this requirement (notification that monitors were up and running) in the rule or guidance, just that monitors were required to be up and running by 1 Jan.

Can you provide me some clarification/guidance on this? If we need to provide this notification, I want to be sure we get it to EPA on time.



Thanks, and have a great day!

Tracy

Respectfully,

Tracy Wharton

NAAQS-SIP Coordinator, Grants, Planning, and Outreach Unit, Air Quality Division

Nebraska Department of Environmental Quality (NDEQ)

1200 N Street, The Atrium, Suite 400

PO Box 98922, Lincoln, NE 68509-8922

Phone: (402) 471-6410

[tracy.wharton@nebraska.gov](mailto:tracy.wharton@nebraska.gov)



**To:** Wharton, Tracy[tracy.wharton@nebraska.gov]  
**From:** Crable, Gregory  
**Sent:** Mon 6/13/2016 2:21:53 PM  
**Subject:** FW: Question about SO2 letter due 1 July 16

Good morning Tracy .... See Amy's response.

**From:** Algae-Eakin, Amy  
**Sent:** Monday, June 13, 2016 9:21 AM  
**To:** Crable, Gregory <Crable.Gregory@epa.gov>  
**Subject:** RE: Question about SO2 letter due 1 July 16

Send to Mark Hague as the RA, and cc Becky, Mike and me.

**From:** Crable, Gregory  
**Sent:** Monday, June 13, 2016 9:20 AM  
**To:** Algae-Eakin, Amy <Algae-Eakin.Amy@epa.gov>  
**Subject:** FW: Question about SO2 letter due 1 July 16

Amy --- ????

**From:** Wharton, Tracy [<mailto:tracy.wharton@nebraska.gov>]  
**Sent:** Friday, June 10, 2016 11:06 AM  
**To:** Crable, Gregory <Crable.Gregory@epa.gov>  
**Cc:** Wiese, Carrie <[carrie.wiese@nebraska.gov](mailto:carrie.wiese@nebraska.gov)>  
**Subject:** Question about SO2 letter due 1 July 16

Greg,

Hi – hope your week has gone well. To whom should our SO2 letter (for the facilities that need to be monitored/ modeled as per DRR) be addressed, and who should be courtesy-copied?



Thank you and have a great weekend!

Tracy

Tracy Wharton

NAAQS-SIP Coordinator, Grants, Planning, and Outreach Unit, Air Quality Division

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1200 N Street, The Atrium, Suite 400

PO Box 98922, Lincoln, NE 68509-8922

Phone: (402) 471-6410

[tracy.wharton@nebraska.gov](mailto:tracy.wharton@nebraska.gov)



**From:** Keith Head  
**Location:** Conference Room #504  
**Importance:** Normal  
**Subject:** FW: Call with MS Power and EPA about SO2 Data Requirements Rule Modeling Protocol comments  
**Start Date/Time:** Thur 8/18/2016 1:00:00 PM  
**End Date/Time:** Thur 8/18/2016 2:00:00 PM

Lynorae and Scott,  
See the scheduled August 18th conference call with MS and representatives from MS Power to discuss our July 18<sup>th</sup> comments on the modeling protocols for the two DRR sources (Plant Daniels and Red Hills).  
Twunjala

-----Original Appointment-----

**From:** Keith Head [<mailto:KHead@mdeq.ms.gov>]  
**Sent:** Monday, August 01, 2016 3:46 PM  
**To:** Keith Head; Benvenutti, Keith M.; Walters, Justin T.; Bell, Tiereny; Pleas McNeel; Howard, Chris; Chad Lafontaine; Conference Room #504; Bradley, Twunjala; Rodney Cuevas; Smith, P. A. (Tony); Hicks, Travis N.; Gillam, Rick  
**Subject:** Call with MS Power and EPA about SO2 Data Requirements Rule Modeling Protocol comments  
**When:** Thursday, August 18, 2016 1:00 PM-2:00 PM (UTC) Monrovia, Reykjavik.  
**Where:** Conference Room #504

Here is the call in information:

**Ex. 6 - Personal Privacy**



**From:** Palmer, Darren  
**Location:** 12D  
**Importance:** Normal  
**Subject:** FW: SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues  
**Start Date/Time:** Fri 12/11/2015 4:00:00 PM  
**End Date/Time:** Fri 12/11/2015 5:00:00 PM

Alabama's Data Requirements Rule conference call.

-----Original Appointment-----

**From:** Palmer, Darren  
**Sent:** Tuesday, December 08, 2015 12:16 PM  
**To:** Palmer, Darren; Corey Masuca; matt.lacke@jcdh.org; mml@adem.state.al.us; lbb@adem.state.al.us; Howanitz, Jason; Curvin, Gina; adh@adem.state.al.us; lynn.geter@jcdh.org  
**Cc:** Walther, Katherine; Garver, Daniel; Rinck, Todd; Bradley, Twunjala; Gillam, Rick  
**Subject:** SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues  
**When:** Friday, December 11, 2015 11:00 AM-12:00 PM (UTC-05:00) Eastern Time (US & Canada).  
**Where:** 12D

Sorry for the abrupt update: would 10-11AM Central work for everyone instead?

## Ex. 6 - Personal Privacy

Time: 11AM-12PM EST (10-11AM CST)

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All,

In preparation for the upcoming Data Requirements Rule (DRR) deadlines, we would like to schedule a call with you to discuss the following:

- The general timeline for the upcoming deadlines outlined in the DRR
- For SO<sub>2</sub> sources that you are already planning or working to characterize:
  - Do you have any questions on the specifics of the monitoring or modeling plans on the work that you have completed so far?
  - Are there any expected complex technical issues associated with the monitoring/modeling of specific sources?
    - Are you expecting to submit alternative model requests?
    - Monitoring technical questions
- An overview of the Monitoring and Modeling Technical Assistance Documents
- QA system for Industrial monitoring (if you are planning to use industrial monitors to comply with the DRR).
- Any questions you have on the overall process

Ideally we would like to have staff from the monitoring, modeling, and SIP groups from both your agencies participate in the call. We would like to have the calls take place sometime during the first two weeks of December (November 30-December 4 or December 7-11).



Please coordinate with those individuals that you would like to have on the call and **email us your availability** during those two weeks by **Monday, November 23**. We expect the calls to be about an hour in duration.

Thank you for your time and please don't hesitate to contact us in the interim if you have any questions!

Darren Palmer  
USEPA - Region 4  
APTMD/AASB  
Air Data & Analysis Section  
PH: (404) 562-9052  
FX: (404) 562-9095  
<http://www.epa.gov/region4>

#### CONFIDENTIALITY NOTICE

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**To:** Chuck Doyno[cdoyno@ALL4INC.COM]; Davis, Scott[Davis.ScottR@epa.gov]; Rinck, Todd[Rinck.Todd@epa.gov]  
**Cc:** Martha Sims[Martha.Sims@ipaper.com]; Billy J Scott[Billy.Scott@ipaper.com]; lbb@adem.state.al.us[lbb@adem.state.al.us]; Healan, Geoffrey (GAH@adem.alabama.gov)[GAH@adem.alabama.gov]  
**From:** Gillam, Rick  
**Sent:** Wed 2/1/2017 11:47:02 AM  
**Subject:** RE: IP Prattville Updated SO2 Modeling

Hello Chuck,

Thanks for providing this additional information. We will review it along with the previous modeling information and let you know if we have any questions.

Regards,

Rick Gillam

**From:** Chuck Doyno [mailto:cdoyno@ALL4INC.COM]  
**Sent:** Tuesday, January 31, 2017 5:04 PM  
**To:** Davis, Scott <Davis.ScottR@epa.gov>; Gillam, Rick <Gillam.Rick@epa.gov>; Rinck, Todd <Rinck.Todd@epa.gov>  
**Cc:** Martha Sims <Martha.Sims@ipaper.com>; Billy J Scott <Billy.Scott@ipaper.com>; lbb@adem.state.al.us; Healan, Geoffrey (GAH@adem.alabama.gov) <GAH@adem.alabama.gov>  
**Subject:** FW: IP Prattville Updated SO2 Modeling

All – Please find the attached updated SO2 DRR modeling files for IP Prattville. The modeling was updated using AERMOD Version 16216r based on conversations with ADEM. Note that the results did not change from what was previously submitted (i.e., 4<sup>th</sup> high concentration was 179.93 µg/m<sup>3</sup>). The attached file extension will need to be updated from “zii” to “zip” prior to accessing the modeling files.

If you have any questions, please give me a call.



Thanks,

Chuck

**Chuck Doyno** | Project Manager

[cdoyno@all4inc.com](mailto:cdoyno@all4inc.com) | 678.460.0324 x204 | [Profile](#) | [LinkedIn](#)

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[Website](#) | [Blog](#) | [Newsletter](#) | [LinkedIn](#) | [Twitter](#) | [Facebook](#) | [Awards](#)

**From:** Chuck Doyno

**Sent:** Tuesday, January 31, 2017 11:20 AM

**To:** Leigh Bacon; Healan, Geoffrey ([GAH@adem.alabama.gov](mailto:GAH@adem.alabama.gov))

**Cc:** Martha Sims; Billy J Scott

**Subject:** IP Prattville Updated SO2 Modeling

Leigh and Geoff – We reran the IP Prattville SO<sub>2</sub> DRR modeling with AERMOD Version 16216r. There was no change in the 4<sup>th</sup> high concentration of 179.93 µg/m<sup>3</sup> from the modeling results submitted as part of the SO<sub>2</sub> DRR Modeling Report. I have attached the updated modeling files for your reference. I wasn't sure if you still had issues receiving zip files, so I changed the file extension to zii to be safe. If you have any questions or need anything else, please give me a call.

Thanks,

Chuck

**Chuck Doyno** | Project Manager

[cdoyno@all4inc.com](mailto:cdoyno@all4inc.com) | 678.460.0324 x204 | [Profile](#) | [LinkedIn](#)

**All4 Inc.** | [Philadelphia](#) | [Atlanta](#) | [Houston](#) | [Washington DC](#)



[Website](#) | [Blog](#) | [Newsletter](#) | [LinkedIn](#) | [Twitter](#) | [Facebook](#) | [Awards](#)



**To:** Davis, Scott[Davis.ScottR@epa.gov]; Gillam, Rick[Gillam.Rick@epa.gov]; Rinck, Todd[Rinck.Todd@epa.gov]  
**Cc:** Martha Sims[Martha.Sims@ipaper.com]; Billy J Scott[Billy.Scott@ipaper.com]; lbb@adem.state.al.us[lbb@adem.state.al.us]; Healan, Geoffrey (GAH@adem.alabama.gov)[GAH@adem.alabama.gov]  
**From:** Chuck Doyno  
**Sent:** Tue 1/31/2017 10:04:21 PM  
**Subject:** FW: IP Prattville Updated SO2 Modeling  
IP Prattville SO2 DRR 16216 run.zii

All – Please find the attached updated SO2 DRR modeling files for IP Prattville. The modeling was updated using AERMOD Version 16216r based on conversations with ADEM. Note that the results did not change from what was previously submitted (i.e., 4<sup>th</sup> high concentration was 179.93 µg/m<sup>3</sup>). The attached file extension will need to be updated from “zii” to “zip” prior to accessing the modeling files.

If you have any questions, please give me a call.

Thanks,

Chuck

**Chuck Doyno** | Project Manager

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**From:** Chuck Doyno  
**Sent:** Tuesday, January 31, 2017 11:20 AM  
**To:** Leigh Bacon; Healan, Geoffrey (GAH@adem.alabama.gov)  
**Cc:** Martha Sims; Billy J Scott  
**Subject:** IP Prattville Updated SO2 Modeling

Leigh and Geoff – We reran the IP Prattville SO<sub>2</sub> DRR modeling with AERMOD Version



16216r. There was no change in the 4<sup>th</sup> high concentration of 179.93 µg/m<sup>3</sup> from the modeling results submitted as part of the SO<sub>2</sub> DRR Modeling Report. I have attached the updated modeling files for your reference. I wasn't sure if you still had issues receiving zip files, so I changed the file extension to zii to be safe. If you have any questions or need anything else, please give me a call.

Thanks,

Chuck

**Chuck Doyno** | Project Manager

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**To:** Davis, Scott[Davis.ScottR@epa.gov]  
**From:** Duff, Melissa (EEC)  
**Sent:** Wed 1/11/2017 2:53:45 PM  
**Subject:** RE: Kentucky submittal for the 2010 SO2 Data Requirements Rule

Thanks Scott. If you don't see it by Friday, let me know. We have the tracking number.

Melissa Duff

502-782-6597

[Melissa.Duff@ky.gov](mailto:Melissa.Duff@ky.gov)

**From:** Davis, Scott [mailto:Davis.ScottR@epa.gov]  
**Sent:** Wednesday, January 11, 2017 9:53 AM  
**To:** Duff, Melissa (EEC); Banister, Beverly; Kemker, Carol; Gettle, Jeaneanne; Benjamin, Lynora; Bradley, Twunjala; Gillam, Rick; Farngalo, Zuri  
**Cc:** Alteri, Sean (EEC); Shewekah, Rick (EEC); Poff, Leslie; Cordes, Ben (EEC)  
**Subject:** RE: Kentucky submittal for the 2010 SO2 Data Requirements Rule

Thanks Melissa – we will be on the lookout for the DVD package.

R. Scott Davis

Chief, Air Planning and Implementation Branch

U.S. Environmental Protection Agency, Region 4

Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW

Atlanta, GA 30303-8960

Telephone (404) 562-9127

Email: [davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

**From:** Duff, Melissa (EEC) [<mailto:melissa.duff@ky.gov>]



**Sent:** Wednesday, January 11, 2017 9:49 AM

**To:** Banister, Beverly <[Banister.Beverly@epa.gov](mailto:Banister.Beverly@epa.gov)>; Kemker, Carol <[Kemker.Carol@epa.gov](mailto:Kemker.Carol@epa.gov)>; Gettle, Jeanneanne <[Gettle.Jeanneanne@epa.gov](mailto:Gettle.Jeanneanne@epa.gov)>; Davis, Scott <[Davis.ScottR@epa.gov](mailto:Davis.ScottR@epa.gov)>; Benjamin, Lynorae <[benjamin.lynorae@epa.gov](mailto:benjamin.lynorae@epa.gov)>; Bradley, Twunjala <[Bradley.Twunjala@epa.gov](mailto:Bradley.Twunjala@epa.gov)>; Gillam, Rick <[Gillam.Rick@epa.gov](mailto:Gillam.Rick@epa.gov)>; Farngalo, Zuri <[Farngalo.Zuri@epa.gov](mailto:Farngalo.Zuri@epa.gov)>

**Cc:** sean.alteri@ky.gov; Shewekah, Rick (EEC) <[Rick.Shewekah@ky.gov](mailto:Rick.Shewekah@ky.gov)>; Poff, Leslie <[LeslieM.Poff@ky.gov](mailto:LeslieM.Poff@ky.gov)>; Cordes, Ben (EEC) <[Ben.Cordes@ky.gov](mailto:Ben.Cordes@ky.gov)>

**Subject:** Kentucky submittal for the 2010 SO<sub>2</sub> Data Requirements Rule

Good morning.

Attached, please find Kentucky's submittal for the 2010 SO<sub>2</sub> Data Requirement Rule. A hard copy, which includes a DVD containing the modeling information, has been sent to the Regional Administrator. We are working to provide an FTP site for the modeling data and will notify you if/when it becomes available.

If you have questions, comments, or concerns, please do not hesitate to contact me.

Thanks.

**Melissa Duff**

Program Planning & Administration Branch Manager

Kentucky Division for Air Quality

300 Sower Boulevard, 2<sup>nd</sup> Floor

Frankfort, KY 40601

502-782-6597

[Melissa.Duff@ky.gov](mailto:Melissa.Duff@ky.gov)







**To:** 'tpm@adem.state.al.us'[tpm@adem.state.al.us]  
**Cc:** Davis, Scott[Davis.ScottR@epa.gov]; Gillam, Rick[Gillam.Rick@epa.gov]; 'bradley.twuanjala@epa.gov'[bradley.twuanjala@epa.gov]; 'Burke, Bob'[rfburk@ascendmaterials.com]; lbb@adem.state.al.us[lbb@adem.state.al.us]; 'David Keen (keen@rtpenv.com)'[keen@rtpenv.com]  
**From:** David Keen  
**Sent:** Fri 12/9/2016 4:13:54 PM  
**Subject:** SO2 DRR Modeling - Ascend Performance Materials - Decatur, Alabama  
[Ascend 1-hr SO2 Model Report \(Final 12-16\).pdf](#)

Please find attached the report documenting the results of the Data Requirements Rule 1-hr SO2 modeling for the Ascend Performance Materials facility in Decatur, Alabama. All of the modeling files and supporting information can be downloaded from our ftp site. The files are in the folder "Ascend Decatur". You can access the ftp site via Windows Explorer (not Internet Explorer) at the following address Ex. 6 - Personal Privacy The user name is Ex. 6 - Personal Privacy and the password is Ex. 6 - Personal Privacy. If you experience trouble accessing the site, please let me know. Please also let me know when you have downloaded the files.

Should you have any questions about the analysis, or require additional information, please let me know.

Sincerely,

David Keen

---

David Keen

RTP Environmental

[keen@rtpenv.com](mailto:keen@rtpenv.com)

(919) 845-1422 x41

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**To:** RWG@adem.alabama.gov[RWG@adem.alabama.gov];  
LWB@adem.alabama.gov[LWB@adem.alabama.gov];  
LBB@adem.alabama.gov[LBB@adem.alabama.gov];  
Justin.B.Green@dep.state.fl.us[Justin.B.Green@dep.state.fl.us];  
jeff.koerner@dep.state.fl.us[jeff.koerner@dep.state.fl.us];  
Preston.McLane@dep.state.fl.us[Preston.McLane@dep.state.fl.us];  
Karen.Hays@dnr.ga.gov[Karen.Hays@dnr.ga.gov]; Dika.Kuoh@dnr.ga.gov[Dika.Kuoh@dnr.ga.gov];  
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Dallas\_Baker@deq.state.ms.us[Dallas\_Baker@deq.state.ms.us];  
keith\_head@deq.state.ms.us[keith\_head@deq.state.ms.us];  
sheila.holman@ncdenr.gov[sheila.holman@ncdenr.gov];  
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brownrj@dhec.sc.gov[brownrj@dhec.sc.gov]; basilej@dhec.sc.gov[basilej@dhec.sc.gov];  
hollisao@dhec.sc.gov[hollisao@dhec.sc.gov]; michelle.b.walker@tn.gov[michelle.b.walker@tn.gov];  
Quincy.Styke@tn.gov[Quincy.Styke@tn.gov]; James.Johnston@tn.gov[James.Johnston@tn.gov];  
bob.rogers@shelbycountyttn.gov[bob.rogers@shelbycountyttn.gov];  
michelle.b.walker@tn.gov[michelle.b.walker@tn.gov]  
**Cc:** Benjamin, Lynorae[benjamin.lynorae@epa.gov]; Ceron, Heather[Ceron.Heather@epa.gov];  
Davis, Scott[Davis.ScottR@epa.gov]  
**From:** Bradley, Twunjala  
**Sent:** Thur 9/15/2016 10:21:05 PM  
**Subject:** FW: SO2 Data Requirements Rule follow up on Enforceability Questions

All,

Please see below for additional information from headquarters(in **bold text**) regarding limiting emissions below 2,000 tpy to comply with the data requirements rule. Again, if you have any questions, please contact myself, Steve Scofield, Lynorae Benjamin or Heather Ceron.

Twunjala Bradley

Twunjala Bradley

**Air Regulatory Management Section**

**Air, Pesticides and Toxics Management Division**

**USEPA, Region 4**

**Atlanta, Georgia**

**(404) 562-9352 office**

**(404) 562-9019 fax**

**bradley.twunjala@epa.gov**



**From:** Davis, Scott

**Sent:** Thursday, September 01, 2016 6:16 PM

**To:** Gore, Ron <RWG@adem.alabama.gov>; Brown, Larry <LWB@adem.alabama.gov>; Bacon, Leigh <LBB@adem.alabama.gov>; Green, Justin B. <Justin.B.Green@dep.state.fl.us>; jeff.koerner@dep.state.fl.us; McLane, Preston <Preston.McLane@dep.state.fl.us>; Hays, Karen <Karen.Hays@dnr.ga.gov>; Kuoh, Dika <Dika.Kuoh@dnr.ga.gov>; Boylan, James <James.Boylan@dnr.ga.gov>; sean.alteri@ky.gov; Duff, Melissa (EEC) <melissa.duff@ky.gov>; Dallas\_Baker@deq.state.ms.us; keith\_head@deq.state.ms.us; Holman, Sheila <sheila.holman@ncdenr.gov>; michael.abraczinskas@ncdenr.gov; sushma.masemore@ncdenr.gov; david.brigman@buncombecounty.org; thompsrb@dhec.sc.gov; Brown, Robbie <brownrj@dhec.sc.gov>; basilej@dhec.sc.gov; Andrew Hollis <hollisao@dhec.sc.gov>; Michelle B. Walker <Michelle.B.Walker@tn.gov>; Quincy Styke <Quincy.Styke@tn.gov>; James Johnston <James.Johnston@tn.gov>; bob.rogers@shelbycountyttn.gov

**Cc:** Benjamin, Lynorae <benjamin.lynorae@epa.gov>; Ceron, Heather <Ceron.Heather@epa.gov>; Bradley, Twunjala <Bradley.Twunjala@epa.gov>; Scofield, Steven <Scofield.Steve@epa.gov>; Gettle, Jeananne <Gettle.Jeananne@epa.gov>; Kemker, Carol <Kemker.Carol@epa.gov>; Fite, Mark <Fite.Mark@epa.gov>

**Subject:** SO2 Data Requirements Rule follow up on Enforceability Questions

Dear Region 4 State Directors:

Thank you for providing the required information related to the data requirements rule (DRR) on July 1, 2016, on how you intend to characterize sources of sulfur dioxide (SO<sub>2</sub>) within your respective states that are subject to the 2,000 tons per year (tpy) threshold through modeling, monitoring or emission limits described in the DRR to inform the next round of SO<sub>2</sub> designations. Most of you should have already received specific feedback on your modeling protocols and/or monitoring network plans. For those specific DRR sources that seek to restrict emissions to below 2,000 tpy through a federally enforceable requirement or permanently shutdown by January 13, 2017, in lieu of characterization (pursuant to section 51.1203(e)), please refer to the requirements below for submitting your final documentation for these sources.

Should you have any questions regarding these requirements, please contact any of our SO<sub>2</sub> staff, Twunjala Bradley or Steve Scofield, or my section chiefs Lynorae Benjamin or Heather Ceron. We will continue to work closely with you and your SO<sub>2</sub> staff to follow up on any questions you may have and provide additional information or clarifications, so please do not hesitate to contact EPA Region 4 throughout this current



characterization process.

Here is the follow up information we currently are providing:

- For those DRR sources subject to a federally-enforceable control measure (such as a fuel switch or other control measures that may restrict emissions or shutdown certain units) lowering emissions below 2,000 tpy, the air agency can either establish an explicit SO<sub>2</sub> emission limit and/or provide specific permit conditions that result in a potential to emit (PTE) to below the DRR threshold. Any explicit SO<sub>2</sub> limit established should be based on a short term averaging-time (1-hour not to exceed 30-day) and cannot simply be an annual cap on emissions. **In some cases, a state may be able to justify use of an annual emission limit, so long as the limit is a rolling average limit, rolled a minimum of every 30 days.** The air agency must ensure that the limit is practicably enforceable (with appropriate compliance parameters).
- The air agency should thoroughly document in the permit how the explicit SO<sub>2</sub> limit or PTE reflect any permit conditions lowering emissions below 2,000 tpy. This includes documenting the permanent shutdown of specific units (i.e. demonstrating the portion of the permit authorizing operation of these units have been rescinded/revoked resulting in a zero PTE). These emission restrictions should be federally enforceable and effective by January 13, 2017. Additionally, where possible, Region 4 requests the review of any permit revisions/modifications.
- For those DRR sources that have indicated a permanent source-wide shutdown by January 13, 2017, explicit documentation through a federally-enforceable mechanism is required to show that the operating permit for that source has been rescinded and/or revoked, resulting in zero PTE.

R. Scott Davis

Chief, Air Planning and Implementation Branch

U.S. Environmental Protection Agency, Region 4

Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW

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email: [davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

<http://www.epa.gov/aboutepa/region4>

<http://www.southeastdiesel.org>



**To:** rwg@adem.state.al.us[rwg@adem.state.al.us]; Larry Brown[lwb@adem.state.al.us]  
**Cc:** Gettle, Jeaneanne[Gettle.Jeaneanne@epa.gov]; Kemker, Carol[Kemker.Carol@epa.gov]; Fite, Mark[Fite.Mark@epa.gov]; Rinck, Todd[Rinck.Todd@epa.gov]; Ackerman, Laura[Ackerman.Laura@epa.gov]; Davis, Scott[Davis.ScottR@epa.gov]; Garver, Daniel[Garver.Daniel@epa.gov]; Palmer, Darren[Palmer.Darren@epa.gov]  
**From:** Worley, Gregg  
**Sent:** Wed 9/14/2016 5:21:14 PM  
**Subject:** SO2 DRR Monitoring Site Proposal

Ron,

Thank you for recently submitting an addendum to Alabama's 2016 ambient air monitoring network plan. In this addendum, ADEM proposed a monitoring site to characterize the maximum ambient 1-hr SO<sub>2</sub> concentrations near the Lhoist facility in Montevallo, Alabama under the SO<sub>2</sub> Data Requirements Rule (40 CFR Part 51, Subpart BB). EPA Region 4 has reviewed this information, and supports the proposed site to characterize the maximum ambient 1-hr SO<sub>2</sub> concentrations near the source.

For final approval of the site, the addendum will need to be revised to include:

- A statement of whether the operation of the monitor meets the requirements of 40 CFR Part 58 Appendices A, B, C, D, and E, as required by 40 CFR §58.10(a)(1).
- The monitoring objective, as required by 40 CFR §58.10(b)(6).

Additionally, as required by 40 CFR §58.10(a)(1), the network plan addendum containing the SO<sub>2</sub> site proposal must be made available for public inspection and comment for at least 30 days prior to submission to the EPA and the submitted plan shall include and address, as appropriate, any received comments. The addendum that is made available for public comment and submitted to EPA for approval should include all of the relevant information that ADEM has submitted to EPA in draft previously, such as the site proposal language, the modeling results and discussion, etc. EPA's official response to the SO<sub>2</sub> site proposal will be included in our response to the 2016 network plan.

Please ensure that the appropriate Quality Assurance Project Plan covering the SO<sub>2</sub> Data Requirements Rule monitoring is updated as necessary and approved by EPA Region 4 SEDS before data collection is required to begin on January 1, 2017.



Thanks,

Gregg

Gregg M. Worley

Chief

Air Analysis & Support Branch

APTMD

U.S. EPA Region 4

(404) 562-9141



**To:** Paul Smith[psmith@trinityconsultants.com]; Gillam, Rick[Gillam.Rick@epa.gov]; Garver, Daniel[Garver.Daniel@epa.gov]; walther.katy@epa.gov[walther.katy@epa.gov]  
**Cc:** john.gowins@ky.gov[john.gowins@ky.gov]; jenniferf.miller@ky.gov[jenniferf.miller@ky.gov]; Cordes, Ben (EEC)[Ben.Cordes@ky.gov]; Davis, Kevin (EEC)[Kevin.Davis@ky.gov]; sean.alteri@ky.gov[sean.alteri@ky.gov]; mark.bertram@bigrivers.com[mark.bertram@bigrivers.com]; Thomas.Shaw@bigrivers.com[Thomas.Shaw@bigrivers.com]; Coomes, Jamie[Jamie.Coomes@centuryaluminum.com]; Brian Otten[botten@trinityconsultants.com]; Worley, Gregg[Worley.Gregg@epa.gov]; Banister, Beverly[Banister.Beverly@epa.gov]; Kemker, Carol[Kemker.Carol@epa.gov]; Davis, Scott[Davis.ScottR@epa.gov]  
**From:** George Schewe  
**Sent:** Thur 3/24/2016 8:44:20 PM  
**Subject:** Plots of Modeling Analysis Results for Century Aluminum and Big Rivers Electric - Revised Sebree Ranking\_Figures\_2016-0324 (Preliminary Draft).pdf

All

We just noticed that Figures 6 and 7 are identical and the overall ranking figure did not get included, which should have been Figure 7 in the pdf file. Thus, I am attaching an updated pdf file with the name changed to

"Sebree Ranking\_Figures\_2016-0324 (Preliminary Draft).pdf"

The file is attached directly to this email.

Again, If you have any questions about the additional files being provided or have any issues accessing them, please do not hesitate to contact Mr. George Schewe, CCM or Paul Smith at 859-341-8100. We look forward to meeting with you next week.

George

**From:** Paul Smith  
**Sent:** Thursday, March 24, 2016 1:47 PM  
**To:** gillam.rick@epa.gov; garver.daniel@epa.gov; walther.katy@epa.gov  
**Cc:** Gowins, John (EEC) <John.Gowins@ky.gov>; Miller, Jennifer F (EEC) <JenniferF.Miller@ky.gov>; Cordes, Ben (EEC) <Ben.Cordes@ky.gov>; Davis, Kevin (EEC) <Kevin.Davis@ky.gov>; Alteri, Sean (EEC) <Sean.Alteri@ky.gov>; mark.bertram@bigrivers.com; Thomas.Shaw@bigrivers.com; Coomes, Jamie <Jamie.Coomes@centuryaluminum.com>; George Schewe



<GSchewe@trinityconsultants.com>; Brian Otten <botten@trinityconsultants.com>; Worley, Gregg <Worley.Gregg@epa.gov>; Banister, Beverly <Banister.Beverly@epa.gov>; Kemker, Carol <Kemker.Carol@epa.gov>; Davis, Scott <Davis.ScottR@epa.gov>

**Subject:** Plots of Modeling Analysis Results for Century Aluminum and Big Rivers Electric

**Importance:** High

In regard to the modeling analyses for Century Aluminum and Big Rivers Electric Corporation, John Gowins at KDAQ let us know earlier today that in addition to the AERMOD modeling files provided earlier this week, EPA was interested in obtaining the preliminary modeling results to help prepare for the meeting next Tuesday at the sites. In response, Trinity has uploaded a zip file to our servers that can be downloaded using the secure URL link provided at the bottom of this email. In the context of the purpose of the modeling analyses, which is to help site an SO<sub>2</sub> ambient monitor, the zip file contains plots showing the receptor grid, normalized design values (NDV), top 200 NDV receptor locations with their frequency ranking, the combined NDV/frequency ranking score (following the methodology prescribed in the draft Monitoring TAD), and the ranking of the combined NDV/frequency scores (from 1 to 200). The zip file also includes the Excel spreadsheet used to post-process the AERMOD model output files to generate these plots and rankings.

As indicated in the modeling methodology report emailed earlier this week, Trinity is working on behalf of Century and Big Rivers to prepare a monitor siting analysis report and submit it to KDAQ by April 15, 2016. This is the date KDAQ requested that monitor siting reports be provided, so they can review them and finalize the state monitoring network plan by July 1, 2016. Thus, it is important to note that the monitor siting analysis work is not yet complete and the ranking process is only the first step in assessing a possible candidate monitor site location. The plots being provided to EPA now are what Trinity intends on presenting and going through with EPA at the March 29<sup>th</sup> meeting. After reviewing the modeling methodology, modeling results, and monitor ranking results, we expect to tour the area around the facilities and discuss the candidate location being considered.

If you have any questions about the additional files being provided or have any issues accessing them, please do not hesitate to contact Mr. George Schewe, CCM or me at 859-341-8100. We look forward to meeting with you next week.

.....  
**Paul J. Smith, P.E.**  
Director

**Trinity Consultants**



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Ex. 6 - Personal Privacy

**From:** Paul Smith

**Sent:** Tuesday, March 22, 2016 6:21 PM

**To:** 'Alteri, Sean (EEC)' <[Sean.Alteri@ky.gov](mailto:Sean.Alteri@ky.gov)>; Worley, Gregg <[Worley.Gregg@epa.gov](mailto:Worley.Gregg@epa.gov)>

**Cc:** Banister, Beverly <[Banister.Beverly@epa.gov](mailto:Banister.Beverly@epa.gov)>; Kemker, Carol <[Kemker.Carol@epa.gov](mailto:Kemker.Carol@epa.gov)>; Davis, Scott <[Davis.ScottR@epa.gov](mailto:Davis.ScottR@epa.gov)>; [Thomas.Shaw@bigrivers.com](mailto:Thomas.Shaw@bigrivers.com); [mark.bertram@bigrivers.com](mailto:mark.bertram@bigrivers.com); Coomes, Jamie <[Jamie.Coomes@centuryaluminum.com](mailto:Jamie.Coomes@centuryaluminum.com)>; Duff, Melissa (EEC) <[melissa.duff@ky.gov](mailto:melissa.duff@ky.gov)>; Gowins, John (EEC) <[John.Gowins@ky.gov](mailto:John.Gowins@ky.gov)>; Miller, Jennifer F (EEC) <[JenniferF.Miller@ky.gov](mailto:JenniferF.Miller@ky.gov)>; Cordes, Ben (EEC) <[Ben.Cordes@ky.gov](mailto:Ben.Cordes@ky.gov)>; Davis, Kevin (EEC) <[Kevin.Davis@ky.gov](mailto:Kevin.Davis@ky.gov)>; George Schewe <[GSchewe@trinityconsultants.com](mailto:GSchewe@trinityconsultants.com)>; Brian Otten <[botten@trinityconsultants.com](mailto:botten@trinityconsultants.com)>

**Subject:** Modeling Files and Modeling Methodology Report for Century Aluminum and Big Rivers Electric

**Importance:** High

On behalf of Century Aluminum and Big Rivers Electric Corporation, Trinity Consultants has prepared a brief report describing the methodology used for the dispersion modeling analyses being conducted as part of the SO<sub>2</sub> ambient monitor siting study underway for these facilities. The monitor siting evaluation report will be separately submitted by April 15, 2016 to the Kentucky Division for Air Quality.

The Acrobat Portfolio PDF file being provided includes the report along with the AERMOD input and output data files and meteorological data files used in the modeling analyses, which EPA expressed interest in having to review ahead of the meeting now scheduled for March 29<sup>th</sup> at the sites to discuss the monitor siting process.

Due to the size of the report file and the attached modeling files, in lieu of sending via email, the file has been uploaded to Trinity's file server and it can be downloaded via the URL link provided at the bottom of this email.

If you have any difficulties accessing the file or in detaching the report and modeling files from the PDF Portfolio, please let me know and I can try to send the files via an alternate method.



.....

**Paul J. Smith, P.E.**  
Director

**Trinity Consultants**

1717 Dixie Hwy, Suite 900 | Covington, Kentucky 41011

Office: 859-341-8100 x102 | Mobile: 859-803-1314

Email: [psmith@trinityconsultants.com](mailto:psmith@trinityconsultants.com) | LinkedIn:

**Ex. 6 - Personal Privacy**

**Files attached to this message**

Filename	Size	Checksum (SHA1)
2016-0324 DRAFT Monitor Siting Modeling Results to EPA.zip	27.7 MB	c255528e2fc80237206c1fc08d52ac11

Please click on the following link to download the attachments:

**Ex. 6 - Personal Privacy**

This email or download link can not be forwarded to anyone else.

The attachments are available until: **Saturday, 23 April.**

Message ID: arNNC99A



**To:** Gillam, Rick[Gillam.Rick@epa.gov]; Garver, Daniel[Garver.Daniel@epa.gov];  
walthers.katy@epa.gov[walthers.katy@epa.gov]  
**Cc:** john.gowins@ky.gov[john.gowins@ky.gov]; jenniferf.miller@ky.gov[jenniferf.miller@ky.gov];  
Cordes, Ben (EEC)[Ben.Cordes@ky.gov]; Davis, Kevin (EEC)[Kevin.Davis@ky.gov];  
sean.alteri@ky.gov[sean.alteri@ky.gov]; mark.bertram@bigrivers.com[mark.bertram@bigrivers.com];  
Thomas.Shaw@bigrivers.com[Thomas.Shaw@bigrivers.com]; Coomes,  
Jamie[Jamie.Coomes@centuryaluminum.com]; George Schewe[GSchewe@trinityconsultants.com];  
Brian Otten[botten@trinityconsultants.com]; Worley, Gregg[Worley.Gregg@epa.gov]; Banister,  
Beverly[Banister.Beverly@epa.gov]; Kemker, Carol[Kemker.Carol@epa.gov]; Davis,  
Scott[Davis.ScottR@epa.gov]  
**From:** Paul Smith  
**Sent:** Thur 3/24/2016 5:47:03 PM  
**Subject:** Plots of Modeling Analysis Results for Century Aluminum and Big Rivers Electric

In regard to the modeling analyses for Century Aluminum and Big Rivers Electric Corporation, John Gowins at KDAQ let us know earlier today that in addition to the AERMOD modeling files provided earlier this week, EPA was interested in obtaining the preliminary modeling results to help prepare for the meeting next Tuesday at the sites. In response, Trinity has uploaded a zip file to our servers that can be downloaded using the secure URL link provided at the bottom of this email. In the context of the purpose of the modeling analyses, which is to help site an SO<sub>2</sub> ambient monitor, the zip file contains plots showing the receptor grid, normalized design values (NDV), top 200 NDV receptor locations with their frequency ranking, the combined NDV/frequency ranking score (following the methodology prescribed in the draft Monitoring TAD), and the ranking of the combined NDV/frequency scores (from 1 to 200). The zip file also includes the Excel spreadsheet used to post-process the AERMOD model output files to generate these plots and rankings.

As indicated in the modeling methodology report emailed earlier this week, Trinity is working on behalf of Century and Big Rivers to prepare a monitor siting analysis report and submit it to KDAQ by April 15, 2016. This is the date KDAQ requested that monitor siting reports be provided, so they can review them and finalize the state monitoring network plan by July 1, 2016. Thus, it is important to note that the monitor siting analysis work is not yet complete and the ranking process is only the first step in assessing a possible candidate monitor site location. The plots being provided to EPA now are what Trinity intends on presenting and going through with EPA at the March 29<sup>th</sup> meeting. After reviewing the modeling methodology, modeling results, and monitor ranking results, we expect to tour the area around the facilities and discuss the candidate location being considered.

If you have any questions about the additional files being provided or have any issues accessing them, please do not hesitate to contact Mr. George Schewe, CCM or me at 859-341-8100. We look forward to meeting with you next week.

.....  
**Paul J. Smith, P.E.**



Director

## Trinity Consultants

1717 Dixie Hwy, Suite 900 | Covington, Kentucky 41011

Office: 859-341-8100 x102 | Mobile: 859-803-1314

Email: [psmith@trinityconsultants.com](mailto:psmith@trinityconsultants.com) | LinkedIn:

### Ex. 6 - Personal Privacy

**From:** Paul Smith

**Sent:** Tuesday, March 22, 2016 6:21 PM

**To:** 'Alteri, Sean (EEC)' <Sean.Alteri@ky.gov>; Worley, Gregg <Worley.Gregg@epa.gov>

**Cc:** Banister, Beverly <Banister.Beverly@epa.gov>; Kemker, Carol <Kemker.Carol@epa.gov>; Davis, Scott <Davis.ScottR@epa.gov>; Thomas.Shaw@bigrivers.com; mark.bertram@bigrivers.com; Coomes, Jamie <Jamie.Coomes@centuryaluminum.com>; Duff, Melissa (EEC) <melissa.duff@ky.gov>; Gowins, John (EEC) <John.Gowins@ky.gov>; Miller, Jennifer F (EEC) <JenniferF.Miller@ky.gov>; Cordes, Ben (EEC) <Ben.Cordes@ky.gov>; Davis, Kevin (EEC) <Kevin.Davis@ky.gov>; George Schewe <GSchewe@trinityconsultants.com>; Brian Otten <botten@trinityconsultants.com>

**Subject:** Modeling Files and Modeling Methodology Report for Century Aluminum and Big Rivers Electric

**Importance:** High

On behalf of Century Aluminum and Big Rivers Electric Corporation, Trinity Consultants has prepared a brief report describing the methodology used for the dispersion modeling analyses being conducted as part of the SO<sub>2</sub> ambient monitor siting study underway for these facilities. The monitor siting evaluation report will be separately submitted by April 15, 2016 to the Kentucky Division for Air Quality.

The Acrobat Portfolio PDF file being provided includes the report along with the AERMOD input and output data files and meteorological data files used in the modeling analyses, which EPA expressed interest in having to review ahead of the meeting now scheduled for March 29<sup>th</sup> at the sites to discuss the monitor siting process.

Due to the size of the report file and the attached modeling files, in lieu of sending via email, the file has been uploaded to Trinity's file server and it can be downloaded via the URL link provided at the bottom of this email.



If you have any difficulties accessing the file or in detaching the report and modeling files from the PDF Portfolio, please let me know and I can try to send the files via an alternate method.

.....

**Paul J. Smith, P.E.**  
Director

**Trinity Consultants**

1717 Dixie Hwy, Suite 900 | Covington, Kentucky 41011

Office: 859-341-8100 x102 | Mobile: 859-803-1314

Email: [psmith@trinityconsultants.com](mailto:psmith@trinityconsultants.com) | LinkedIn:

**Ex. 6 - Personal Privacy**

**Files attached to this message**

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2016-0324 DRAFT Monitor Siting Modeling Results to EPA.zip	27.7 MB	c255528e2fc80237206c1fc08d52ac1

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The attachments are available until: **Saturday, 23 April.**

Message ID: arNNC99A



**To:** Paul Smith[psmith@trinityconsultants.com]; sean.alteri@ky.gov[sean.alteri@ky.gov]; Worley, Gregg[Worley.Gregg@epa.gov]  
**Cc:** Banister, Beverly[Banister.Beverly@epa.gov]; Kemker, Carol[Kemker.Carol@epa.gov]; Davis, Scott[Davis.ScottR@epa.gov]; Thomas.Shaw@bigrivers.com[Thomas.Shaw@bigrivers.com]; mark.bertram@bigrivers.com[mark.bertram@bigrivers.com]; Coomes, Jamie[Jamie.Coomes@centuryaluminum.com]; Duff, Melissa (EEC)[melissa.duff@ky.gov]; john.gowins@ky.gov[john.gowins@ky.gov]; jenniferf.miller@ky.gov[jenniferf.miller@ky.gov]; Cordes, Ben (EEC)[Ben.Cordes@ky.gov]; Davis, Kevin (EEC)[Kevin.Davis@ky.gov]; Brian Otten[botten@trinityconsultants.com]  
**From:** George Schewe  
**Sent:** Wed 3/23/2016 2:35:54 PM  
**Subject:** RE: Modeling Files and Modeling Methodology Report for Century Aluminum and Big Rivers Electric

All

Just as a follow up to Paul Smith's email last evening and in case you were looking for an attachment with the modeling report, it was not attached. As Paul indicated, there is a url link at the bottom of the email indicating where to obtain the modeling report.

If you have any trouble downloading or questions, please direct them to myself, [gschewe@trinityconsultants.com](mailto:gschewe@trinityconsultants.com)

Thanks and have a good day.

George

**Subject:** Modeling Files and Modeling Methodology Report for Century Aluminum and Big Rivers Electric  
**Importance:** High

On behalf of Century Aluminum and Big Rivers Electric Corporation, Trinity Consultants has prepared a brief report describing the methodology used for the dispersion modeling analyses being conducted as part of the SO2 ambient monitor siting study underway for these facilities. The monitor siting evaluation report will be separately submitted by April 15, 2016 to the Kentucky Division for Air Quality.



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Due to the size of the report file and the attached modeling files, in lieu of sending via email, the file has been uploaded to Trinity's file server and it can be downloaded via the URL link provided at the bottom of this email.

If you have any difficulties accessing the file or in detaching the report and modeling files from the PDF Portfolio, please let me know and I can try to send the files via an alternate method.

.....  
**Paul J. Smith, P.E.**  
Director

#### Trinity Consultants

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Office: 859-341-8100 x102 | Mobile: 859-803-1314

Email: [psmith@trinityconsultants.com](mailto:psmith@trinityconsultants.com) | LinkedIn:

**Ex. 6 - Personal Privacy**

**From:** Alteri, Sean (EEC) [<mailto:Sean.Alteri@ky.gov>]

**Sent:** Wednesday, March 16, 2016 2:15 PM

**To:** [tom.shaw@bigrivers.com](mailto:tom.shaw@bigrivers.com); [mark.bertram@bigrivers.com](mailto:mark.bertram@bigrivers.com); 'Coomes, Jamie' ([Jamie.Coomes@centuryaluminum.com](mailto:Jamie.Coomes@centuryaluminum.com)) <[Jamie.Coomes@centuryaluminum.com](mailto:Jamie.Coomes@centuryaluminum.com)>; Paul Smith <[psmith@trinityconsultants.com](mailto:psmith@trinityconsultants.com)>

**Cc:** Shewekah, Rick (EEC) <[Rick.Shewekah@ky.gov](mailto:Rick.Shewekah@ky.gov)>; Duff, Melissa (EEC) <[melissa.duff@ky.gov](mailto:melissa.duff@ky.gov)>; Gowins, John (EEC) <[John.Gowins@ky.gov](mailto:John.Gowins@ky.gov)>; Cordes, Ben (EEC) <[Ben.Cordes@ky.gov](mailto:Ben.Cordes@ky.gov)>

**Subject:** Modeling for Site location



EPA has requested your modeling information as soon as possible to provide better feedback during the meeting. Please let me know if we can assist in the matter.

Thank you,

Sean

Sean Alteri, Director

Division for Air Quality

200 Fair Oaks Lane, 1st Floor

Frankfort, Kentucky 40601

(502) 564-3999 ext 4400

(502) 564-4666 (fax)

<http://air.ky.gov>

**From:** Alteri, Sean (EEC) [<mailto:Sean.Alteri@ky.gov>]

**Sent:** Wednesday, March 16, 2016 11:11 AM

**To:** Worley, Gregg <[Worley.Gregg@epa.gov](mailto:Worley.Gregg@epa.gov)>

**Cc:** Banister, Beverly <[Banister.Beverly@epa.gov](mailto:Banister.Beverly@epa.gov)>; Kemker, Carol <[Kemker.Carol@epa.gov](mailto:Kemker.Carol@epa.gov)>;

Davis, Scott <[Davis.ScottR@epa.gov](mailto:Davis.ScottR@epa.gov)>; [Thomas.Shaw@bigrivers.com](mailto:Thomas.Shaw@bigrivers.com);

[mark.bertram@bigrivers.com](mailto:mark.bertram@bigrivers.com); Coomes, Jamie <[Jamie.Coomes@centuryaluminum.com](mailto:Jamie.Coomes@centuryaluminum.com)>; Paul

Smith <[psmith@trinityconsultants.com](mailto:psmith@trinityconsultants.com)>; Duff, Melissa (EEC) <[melissa.duff@ky.gov](mailto:melissa.duff@ky.gov)>; Gowins,

John (EEC) <[John.Gowins@ky.gov](mailto:John.Gowins@ky.gov)>; Miller, Jennifer F (EEC) <[JenniferF.Miller@ky.gov](mailto:JenniferF.Miller@ky.gov)>;

Cordes, Ben (EEC) <[Ben.Cordes@ky.gov](mailto:Ben.Cordes@ky.gov)>; Davis, Kevin (EEC) <[Kevin.Davis@ky.gov](mailto:Kevin.Davis@ky.gov)>



**Subject:** RE: Meeting to Discuss SO2 DRR Ambient Monitor Siting Conclusions for Area Around Century Aluminum and Big Rivers

Thank you for the quick reply, Gregg.

If EPA is able to meet in the area, I think that a visit to the proposed site location would be advantageous. Great suggestion.

Sean

**From:** Worley, Gregg [<mailto:Worley.Gregg@epa.gov>]  
**Sent:** Wednesday, March 16, 2016 11:08 AM  
**To:** Alteri, Sean (EEC)  
**Cc:** Banister, Beverly; Kemker, Carol; Davis, Scott; [Thomas.Shaw@bigrivers.com](mailto:Thomas.Shaw@bigrivers.com); [mark.bertram@bigrivers.com](mailto:mark.bertram@bigrivers.com); Coomes, Jamie; Paul Smith; Duff, Melissa (EEC); Gowins, John (EEC); Miller, Jennifer F (EEC); Cordes, Ben (EEC); Davis, Kevin (EEC)  
**Subject:** Re: Meeting to Discuss SO2 DRR Ambient Monitor Siting Conclusions for Area Around Century Aluminum and Big Rivers

Sean,

I will check the dates with my staff. Are you anticipating site visits for the proposed monitor location as part of this meeting?

Gregg

Sent from my iPhone

On Mar 16, 2016, at 11:01 AM, Alteri, Sean (EEC) <[Sean.Alteri@ky.gov](mailto:Sean.Alteri@ky.gov)> wrote:

Good morning, Beverly.

As mentioned in our brief conference call yesterday afternoon, the Division for Air Quality met with representatives of Big Rivers and Century Aluminum to discuss the monitoring requirements to characterize SO2 concentrations pursuant to the SO2 Data Requirements



Rule (DRR). The facilities have jointly conducted preliminary air dispersion modeling and analysis consistent with the monitoring TAD and modeling TAD, where appropriate. Due to the significant costs and efforts associated with establishing and operating a monitoring site, I find it appropriate to present the information and receive feedback from EPA Region 4 as soon as possible.

In our previous discussions, I explained that our intention is to include the SO<sub>2</sub> monitoring information for the DRR in our 2016 Network Plan prior to the 30 day public comment period. To meet the pressing deadlines, I propose that we meet either **March 30 or 31, 2016**. This will allow two weeks for the facilities to complete their submittal and provide the information by April 15, 2016, as requested by the Division.

An in-person meeting is preferable. Please let us know if you and your staff are available on those dates to meet and discuss the monitoring requirements. In our meeting yesterday, the Division recommended the facilities provide Region 4 with relevant information one week prior to the meeting, if possible.

Thank you,

Sean

Sean Alteri, Director

Division for Air Quality

200 Fair Oaks Lane, 1st Floor

Frankfort, Kentucky 40601

(502) 564-3999 ext 4400

(502) 564-4666 (fax)

<http://air.ky.gov>



**Files attached to this message**

Filename	Size	Checksum (SHA1)
Methodology for Modeling for SO2 DRR Monitor Siting- BREC and Century 2016-0322 (With Model Files Attached).pdf	9.35 MB	c28e13f02c85cbd0e67e5c

Please click on the following link to download the attachments:

**Ex. 6 - Personal Privacy**

This email or download link can not be forwarded to anyone else.

The attachments are available until: **Thursday, 21 April.**

Message ID: t38H6xvs



**To:** Worley, Gregg[Worley.Gregg@epa.gov]  
**Cc:** Banister, Beverly[Banister.Beverly@epa.gov]; Kemker, Carol[Kemker.Carol@epa.gov]; Davis, Scott[Davis.ScottR@epa.gov]; Thomas.Shaw@bigrivers.com[Thomas.Shaw@bigrivers.com]; mark.bertram@bigrivers.com[mark.bertram@bigrivers.com]; Coomes, Jamie[Jamie.Coomes@centuryaluminum.com]; Paul Smith[psmith@trinityconsultants.com]; Duff, Melissa (EEC)[melissa.duff@ky.gov]; john.gowins@ky.gov[john.gowins@ky.gov]; jenniferf.miller@ky.gov[jenniferf.miller@ky.gov]; Cordes, Ben (EEC)[Ben.Cordes@ky.gov]; Davis, Kevin (EEC)[Kevin.Davis@ky.gov]  
**From:** Alteri, Sean (EEC)  
**Sent:** Wed 3/16/2016 3:10:57 PM  
**Subject:** RE: Meeting to Discuss SO2 DRR Ambient Monitor Siting Conclusions for Area Around Century Aluminum and Big Rivers

Thank you for the quick reply, Gregg.

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**From:** Worley, Gregg [mailto:Worley.Gregg@epa.gov]  
**Sent:** Wednesday, March 16, 2016 11:08 AM  
**To:** Alteri, Sean (EEC)  
**Cc:** Banister, Beverly; Kemker, Carol; Davis, Scott; Thomas.Shaw@bigrivers.com; mark.bertram@bigrivers.com; Coomes, Jamie; Paul Smith; Duff, Melissa (EEC); Gowins, John (EEC); Miller, Jennifer F (EEC); Cordes, Ben (EEC); Davis, Kevin (EEC)  
**Subject:** Re: Meeting to Discuss SO2 DRR Ambient Monitor Siting Conclusions for Area Around Century Aluminum and Big Rivers

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Division for Air Quality

200 Fair Oaks Lane, 1st Floor

Frankfort, Kentucky 40601

(502) 564-3999 ext 4400



(502) 564-4666 (fax)

<http://air.ky.gov>



**To:** sean.alteri@ky.gov[sean.alteri@ky.gov]  
**Cc:** Banister, Beverly[Banister.Beverly@epa.gov]; Kernker, Carol[Kernker.Carol@epa.gov]; Davis, Scott[Davis.ScottR@epa.gov]; Thomas.Shaw@bigrivers.com[Thomas.Shaw@bigrivers.com]; mark.bertram@bigrivers.com[mark.bertram@bigrivers.com]; Coomes, Jamie[Jamie.Coomes@centuryaluminum.com]; Paul Smith[psmith@trinityconsultants.com]; Duff, Melissa (EEC)[melissa.duff@ky.gov]; john.gowins@ky.gov[john.gowins@ky.gov]; jenniferf.miller@ky.gov[jenniferf.miller@ky.gov]; Cordes, Ben (EEC)[Ben.Cordes@ky.gov]; Davis, Kevin (EEC)[Kevin.Davis@ky.gov]  
**From:** Worley, Gregg  
**Sent:** Wed 3/16/2016 3:07:50 PM  
**Subject:** Re: Meeting to Discuss SO2 DRR Ambient Monitor Siting Conclusions for Area Around Century Aluminum and Big Rivers

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Sent from my iPhone

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**To:** Banister, Beverly[Banister.Beverly@epa.gov]; Kemker, Carol[Kemker.Carol@epa.gov]; Worley, Gregg[Worley.Gregg@epa.gov]; Davis, Scott[Davis.ScottR@epa.gov]; Thomas.Shaw@bigrivers.com[Thomas.Shaw@bigrivers.com]; mark.bertram@bigrivers.com[mark.bertram@bigrivers.com]; Coomes, Jamie[Jamie.Coomes@centuryaluminum.com]; Paul Smith[psmith@trinityconsultants.com]  
**Cc:** Duff, Melissa (EEC)[melissa.duff@ky.gov]; john.gowins@ky.gov[john.gowins@ky.gov]; jenniferf.miller@ky.gov[jenniferf.miller@ky.gov]; Cordes, Ben (EEC)[Ben.Cordes@ky.gov]; Davis, Kevin (EEC)[Kevin.Davis@ky.gov]  
**From:** Alteri, Sean (EEC)  
**Sent:** Wed 3/16/2016 3:01:15 PM  
**Subject:** Meeting to Discuss SO2 DRR Ambient Monitor Siting Conclusions for Area Around Century Aluminum and Big Rivers

Good morning, Beverly.

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Sean Alteri, Director  
Division for Air Quality  
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Frankfort, Kentucky 40601  
(502) 564-3999 ext 4400  
(502) 564-4666 (fax)  
<http://air.ky.gov>



**To:** Duff, Melissa (EEC)[melissa.duff@ky.gov]; Banister, Beverly[Banister.Beverly@epa.gov]; Kemker, Carol[Kemker.Carol@epa.gov]; Gettle, Jeaneanne[Gettle.Jeaneanne@epa.gov]; Benjamin, Lynorae[benjamin.lynorae@epa.gov]; Bradley, Twunjala[Bradley.Twunjala@epa.gov]; Gillam, Rick[Gillam.Rick@epa.gov]; Farngalo, Zuri[Farngalo.Zuri@epa.gov]  
**Cc:** sean.alteri@ky.gov[sean.alteri@ky.gov]; Shewekah, Rick (EEC)[Rick.Shewekah@ky.gov]; Poff, Leslie[LeslieM.Poff@ky.gov]; Cordes, Ben (EEC)[Ben.Cordes@ky.gov]  
**From:** Davis, Scott  
**Sent:** Wed 1/11/2017 2:52:39 PM  
**Subject:** RE: Kentucky submittal for the 2010 SO2 Data Requirements Rule

Thanks Melissa – we will be on the lookout for the DVD package.

R. Scott Davis

Chief, Air Planning and Implementation Branch

U.S. Environmental Protection Agency, Region 4

Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW

Atlanta, GA 30303-8960

Telephone (404) 562-9127

Email: [davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

**From:** Duff, Melissa (EEC) [mailto:melissa.duff@ky.gov]  
**Sent:** Wednesday, January 11, 2017 9:49 AM  
**To:** Banister, Beverly <Banister.Beverly@epa.gov>; Kemker, Carol <Kemker.Carol@epa.gov>; Gettle, Jeaneanne <Gettle.Jeaneanne@epa.gov>; Davis, Scott <Davis.ScottR@epa.gov>; Benjamin, Lynorae <benjamin.lynorae@epa.gov>; Bradley, Twunjala <Bradley.Twunjala@epa.gov>; Gillam, Rick <Gillam.Rick@epa.gov>; Farngalo, Zuri <Farngalo.Zuri@epa.gov>  
**Cc:** sean.alteri@ky.gov; Shewekah, Rick (EEC) <Rick.Shewekah@ky.gov>; Poff, Leslie <LeslieM.Poff@ky.gov>; Cordes, Ben (EEC) <Ben.Cordes@ky.gov>  
**Subject:** Kentucky submittal for the 2010 SO2 Data Requirements Rule

Good morning.



Attached, please find Kentucky's submittal for the 2010 SO<sub>2</sub> Data Requirement Rule. A hard copy, which includes a DVD containing the modeling information, has been sent to the Regional Administrator. We are working to provide an FTP site for the modeling data and will notify you if/when it becomes available.

If you have questions, comments, or concerns, please do not hesitate to contact me.

Thanks.

**Melissa Duff**

Program Planning & Administration Branch Manager

Kentucky Division for Air Quality

300 Sower Boulevard, 2<sup>nd</sup> Floor

Frankfort, KY 40601

502-782-6597

[Melissa.Duff@ky.gov](mailto:Melissa.Duff@ky.gov)



**To:** RWG@adem.alabama.gov[RWG@adem.alabama.gov];  
LWB@adem.alabama.gov[LWB@adem.alabama.gov];  
LBB@adem.alabama.gov[LBB@adem.alabama.gov];  
jeff.koerner@dep.state.fl.us[jeff.koerner@dep.state.fl.us];  
Preston.McLane@dep.state.fl.us[Preston.McLane@dep.state.fl.us];  
Karen.Hays@dnr.ga.gov[Karen.Hays@dnr.ga.gov]; Dika.Kuoh@dnr.ga.gov[Dika.Kuoh@dnr.ga.gov];  
James.Boylan@dnr.ga.gov[James.Boylan@dnr.ga.gov]; sean.alteri@ky.gov[sean.alteri@ky.gov];  
melissa.duff@ky.gov[melissa.duff@ky.gov];  
Dallas\_Baker@deq.state.ms.us[Dallas\_Baker@deq.state.ms.us];  
keith\_head@deq.state.ms.us[keith\_head@deq.state.ms.us];  
sheila.holman@ncdenr.gov[sheila.holman@ncdenr.gov];  
michael.abraczinskas@ncdenr.gov[michael.abraczinskas@ncdenr.gov];  
sushma.masemore@ncdenr.gov[sushma.masemore@ncdenr.gov];  
david.brigman@buncombecounty.org[david.brigman@buncombecounty.org];  
brownrj@dhec.sc.gov[brownrj@dhec.sc.gov]; basilej@dhec.sc.gov[basilej@dhec.sc.gov];  
hollisao@dhec.sc.gov[hollisao@dhec.sc.gov]; michelle.b.walker@tn.gov[michelle.b.walker@tn.gov];  
Quincy.Styke@tn.gov[Quincy.Styke@tn.gov]; James.Johnston@tn.gov[James.Johnston@tn.gov];  
bob.rogers@shelbycountyttn.gov[bob.rogers@shelbycountyttn.gov];  
michelle.b.walker@tn.gov[michelle.b.walker@tn.gov]; thompsrb@dhec.sc.gov[thompsrb@dhec.sc.gov];  
corey.m.masuca@jcdh.org[corey.m.masuca@jcdh.org];  
laliddington@aqm.co.knox.tn.us[laliddington@aqm.co.knox.tn.us]; John Hornback[hornback@metro4-sesarm.org]  
**Cc:** Benjamin, Lynorae[benjamin.lynorae@epa.gov]; Ceron, Heather[Ceron.Heather@epa.gov];  
Bradley, Twunjala[Bradley.Twunjala@epa.gov]; Scofield, Steven[Scofield.Steve@epa.gov]; Gillam,  
Rick[Gillam.Rick@epa.gov]; Garver, Daniel[Garver.Daniel@epa.gov]; Rinck, Todd[Rinck.Todd@epa.gov];  
Worley, Gregg[worley.gregg@epa.gov]; Carol Kemker[Kemker.Carol@epa.gov]; Gettle,  
Jeaneanne[Gettle.Jeaneanne@epa.gov]; Banister, Beverly[Banister.Beverly@epa.gov]  
**From:** Davis, Scott  
**Sent:** Thur 11/17/2016 9:43:47 PM  
**Subject:** SO2 DRR Follow up from State/Local Air Directors Meeting - Enforceability Question

We are following up on a question raised at last week's State/Local Air Directors Meeting on our September 15, 2016 email we sent to our Region 4 agencies on the SO2 DRR. Anna Wood, Chet Wayland and OAQPS agree that the information in the September 15 email continues to be the EPA position. That email is below. As we presented last week, please continue to raise any modeling questions to Rick Gillam, monitoring questions to Daniel Garver and technical/policy questions to Twunjala Bradley and they will engage others on our SO2 team here and at EPA Headquarters to answer your questions and provide clarification or information. Thanks.

R. Scott Davis

Chief, Air Planning and Implementation Branch

U.S. Environmental Protection Agency, Region 4

Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW

Atlanta, GA 30303-8960



Telephone: (404) 562-9127

email: [davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

<http://www.epa.gov/aboutepa/region4>

<http://www.southeastdiesel.org>

**From:** Bradley, Twunjala

**Sent:** Thursday, September 15, 2016 6:21 PM

**To:** RWG@adem.alabama.gov; LWB@adem.alabama.gov; LBB@adem.alabama.gov; Justin.B.Green@dep.state.fl.us; jeff.koerner@dep.state.fl.us; Preston.McLane@dep.state.fl.us; Karen.Hays@dnr.ga.gov; Dika.Kuoh@dnr.ga.gov; James.Boylan@dnr.ga.gov; sean.alteri@ky.gov; melissa.duff@ky.gov; Dallas\_Baker@deq.state.ms.us; keith\_head@deq.state.ms.us; sheila.holman@ncdenr.gov; michael.abraczinskas@ncdenr.gov; sushma.masemore@ncdenr.gov; david.brigman@buncombecounty.org; brownrj@dhec.sc.gov; basilej@dhec.sc.gov; hollisao@dhec.sc.gov; michelle.b.walker@tn.gov; Quincy.Styke@tn.gov; James.Johnston@tn.gov; bob.rogers@shelbycountyttn.gov; michelle.b.walker@tn.gov

**Cc:** Benjamin, Lynorae <[benjamin.lynorae@epa.gov](mailto:benjamin.lynorae@epa.gov)>; Ceron, Heather <[Ceron.Heather@epa.gov](mailto:Ceron.Heather@epa.gov)>; Davis, Scott <[Davis.ScottR@epa.gov](mailto:Davis.ScottR@epa.gov)>

**Subject:** FW: SO2 Data Requirements Rule follow up on Enforceability Questions

All,

Please see below for additional information from headquarters(in **bold text**) regarding limiting emissions below 2,000 tpy to comply with the data requirements rule. Again, if you have any questions, please contact myself, Steve Scofield, Lynorae Benjamin or Heather Ceron.

Twunjala Bradley

Twunjala Bradley

**Air Regulatory Management Section**

**Air, Pesticides and Toxics Management Division  
USEPA, Region 4  
Atlanta, Georgia**



(404) 562-9352 office  
(404) 562-9019 fax  
[bradley.twunjala@epa.gov](mailto:bradley.twunjala@epa.gov)

**From:** Davis, Scott

**Sent:** Thursday, September 01, 2016 6:16 PM

**To:** Gore, Ron <[RWG@adem.alabama.gov](mailto:RWG@adem.alabama.gov)>; Brown, Larry <[LWB@adem.alabama.gov](mailto:LWB@adem.alabama.gov)>; Bacon, Leigh <[LBB@adem.alabama.gov](mailto:LBB@adem.alabama.gov)>; Green, Justin B. <[Justin.B.Green@dep.state.fl.us](mailto:Justin.B.Green@dep.state.fl.us)>; [jeff.koerner@dep.state.fl.us](mailto:jeff.koerner@dep.state.fl.us); McLane, Preston <[Preston.McLane@dep.state.fl.us](mailto:Preston.McLane@dep.state.fl.us)>; Hays, Karen <[Karen.Hays@dnr.ga.gov](mailto:Karen.Hays@dnr.ga.gov)>; Kuoh, Dika <[Dika.Kuoh@dnr.ga.gov](mailto:Dika.Kuoh@dnr.ga.gov)>; Boylan, James <[James.Boylan@dnr.ga.gov](mailto:James.Boylan@dnr.ga.gov)>; [sean.alteri@ky.gov](mailto:sean.alteri@ky.gov); Duff, Melissa (EEC) <[melissa.duff@ky.gov](mailto:melissa.duff@ky.gov)>; Dallas Baker <[Dallas\\_Baker@deq.state.ms.us](mailto:Dallas_Baker@deq.state.ms.us)>; [keith\\_head@deq.state.ms.us](mailto:keith_head@deq.state.ms.us); Holman, Sheila <[sheila.holman@ncdenr.gov](mailto:sheila.holman@ncdenr.gov)>; [michael.abraczinskas@ncdenr.gov](mailto:michael.abraczinskas@ncdenr.gov); [sushma.masemore@ncdenr.gov](mailto:sushma.masemore@ncdenr.gov); [david.brigman@buncombecounty.org](mailto:david.brigman@buncombecounty.org); [thompsrb@dhec.sc.gov](mailto:thompsrb@dhec.sc.gov); Brown, Robbie <[brownrj@dhec.sc.gov](mailto:brownrj@dhec.sc.gov)>; [basilej@dhec.sc.gov](mailto:basilej@dhec.sc.gov); Andrew Hollis <[hollisao@dhec.sc.gov](mailto:hollisao@dhec.sc.gov)>; Michelle B. Walker <[Michelle.B.Walker@tn.gov](mailto:Michelle.B.Walker@tn.gov)>; Quincy Styke <[Quincy.Styke@tn.gov](mailto:Quincy.Styke@tn.gov)>; James Johnston <[James.Johnston@tn.gov](mailto:James.Johnston@tn.gov)>; [bob.rogers@shelbycountyttn.gov](mailto:bob.rogers@shelbycountyttn.gov)

**Cc:** Benjamin, Lynorae <[benjamin.lynorae@epa.gov](mailto:benjamin.lynorae@epa.gov)>; Ceron, Heather <[Ceron.Heather@epa.gov](mailto:Ceron.Heather@epa.gov)>; Bradley, Twunjala <[Bradley.Twunjala@epa.gov](mailto:Bradley.Twunjala@epa.gov)>; Scofield, Steven <[Scofield.Steve@epa.gov](mailto:Scofield.Steve@epa.gov)>; Gettle, Jeaneanne <[Gettle.Jeaneanne@epa.gov](mailto:Gettle.Jeaneanne@epa.gov)>; Kemker, Carol <[Kemker.Carol@epa.gov](mailto:Kemker.Carol@epa.gov)>; Fite, Mark <[Fite.Mark@epa.gov](mailto:Fite.Mark@epa.gov)>

**Subject:** SO2 Data Requirements Rule follow up on Enforceability Questions

Dear Region 4 State Directors:

Thank you for providing the required information related to the data requirements rule (DRR) on July 1, 2016, on how you intend to characterize sources of sulfur dioxide (SO<sub>2</sub>) within your respective states that are subject to the 2,000 tons per year (tpy) threshold through modeling, monitoring or emission limits described in the DRR to inform the next round of SO<sub>2</sub> designations. Most of you should have already received specific feedback on your modeling protocols and/or monitoring network plans. For those specific DRR sources that seek to restrict emissions to below 2,000 tpy through a federally enforceable requirement or permanently shutdown by January 13, 2017, in lieu of characterization (pursuant to section 51.1203(e)), please refer to the requirements below for submitting your final documentation for these sources.

Should you have any questions regarding these requirements, please contact any of our



SO2 staff, Twunjala Bradley or Steve Scofield, or my section chiefs Lynorae Benjamin or Heather Ceron. We will continue to work closely with you and your SO2 staff to follow up on any questions you may have and provide additional information or clarifications, so please do not hesitate to contact EPA Region 4 throughout this current characterization process.

Here is the follow up information we currently are providing:

- For those DRR sources subject to a federally-enforceable control measure (such as a fuel switch or other control measures that may restrict emissions or shutdown certain units) lowering emissions below 2,000 tpy, the air agency can either establish an explicit SO<sub>2</sub> emission limit and/or provide specific permit conditions that result in a potential to emit (PTE) to below the DRR threshold. Any explicit SO<sub>2</sub> limit established should be based on a short term averaging-time (1-hour not to exceed 30-day) and cannot simply be an annual cap on emissions. **In some cases, a state may be able to justify use of an annual emission limit, so long as the limit is a rolling average limit, rolled a minimum of every 30 days.** The air agency must ensure that the limit is practicably enforceable (with appropriate compliance parameters).
- The air agency should thoroughly document in the permit how the explicit SO<sub>2</sub> limit or PTE reflect any permit conditions lowering emissions below 2,000 tpy. This includes documenting the permanent shutdown of specific units (i.e. demonstrating the portion of the permit authorizing operation of these units have been rescinded/revoked resulting in a zero PTE). These emission restrictions should be federally enforceable and effective by January 13, 2017. Additionally, where possible, Region 4 requests the review of any permit revisions/modifications.
- For those DRR sources that have indicated a permanent source-wide shutdown by January 13, 2017, explicit documentation through a federally-enforceable mechanism is required to show that the operating permit for that source has been rescinded and/or revoked, resulting in zero PTE.

R. Scott Davis

Chief, Air Planning and Implementation Branch

U.S. Environmental Protection Agency, Region 4

Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW

Atlanta, GA 30303-8960



Telephone: (404) 562-9127

email: [davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

<http://www.epa.gov/aboutepa/region4>

<http://www.southeastdiesel.org>



**To:** Gore, Ron[RWG@adem.alabama.gov]; Brown, Larry[LWB@adem.alabama.gov]; Bacon, Leigh[LBB@adem.alabama.gov]; Green, Justin B.[Justin.B.Green@dep.state.fl.us]; jeff.koerner@dep.state.fl.us[jeff.koerner@dep.state.fl.us]; McLane, Preston[Preston.McLane@dep.state.fl.us]; Hays, Karen[Karen.Hays@dnr.ga.gov]; Kuoh, Dika[Dika.Kuoh@dnr.ga.gov]; Boylan, James[James.Boylan@dnr.ga.gov]; Alteri, Sean (EEC)[sean.alteri@ky.gov]; Duff, Melissa (EEC)[melissa.duff@ky.gov]; Dallas\_Baker@deq.state.ms.us[Dallas\_Baker@deq.state.ms.us]; keith\_head@deq.state.ms.us[keith\_head@deq.state.ms.us]; Holman, Sheila[sheila.holman@ncdenr.gov]; Abraczinskas, Michael[michael.abraczinskas@ncdenr.gov]; sushma.masemore@ncdenr.gov[sushma.masemore@ncdenr.gov]; david.brigman@buncombecounty.org[david.brigman@buncombecounty.org]; thompsrb@dhec.sc.gov[thompsrb@dhec.sc.gov]; Brown, Robbie[brownrj@dhec.sc.gov]; basilej@dhec.sc.gov[basilej@dhec.sc.gov]; Andrew Hollis[hollisao@dhec.sc.gov]; Michelle B. Walker[Michelle.B.Walker@tn.gov]; Quincy Styke[Quincy.Styke@tn.gov]; James Johnston[James.Johnston@tn.gov]; bob.rogers@shelbycountyttn.gov[bob.rogers@shelbycountyttn.gov]  
**Cc:** Benjamin, Lynorae[benjamin.lynorae@epa.gov]; Heather Ceron (Ceron.Heather@epa.gov)[Ceron.Heather@epa.gov]; Bradley, Twunjala[Bradley.Twunjala@epa.gov]; Scofield, Steven[Scofield.Steve@epa.gov]; Gettle, Jeaneanne[Gettle.Jeaneanne@epa.gov]; Carol Kemker[Kemker.Carol@epa.gov]; Fite, Mark[Fite.Mark@epa.gov]  
**From:** Davis, Scott  
**Sent:** Thur 9/1/2016 10:16:12 PM  
**Subject:** SO2 Data Requirements Rule follow up on Enforceability Questions

Dear Region 4 State Directors:

Thank you for providing the required information related to the data requirements rule (DRR) on July 1, 2016, on how you intend to characterize sources of sulfur dioxide (SO<sub>2</sub>) within your respective states that are subject to the 2,000 tons per year (tpy) threshold through modeling, monitoring or emission limits described in the DRR to inform the next round of SO<sub>2</sub> designations. Most of you should have already received specific feedback on your modeling protocols and/or monitoring network plans. For those specific DRR sources that seek to restrict emissions to below 2,000 tpy through a federally enforceable requirement or permanently shutdown by January 13, 2017, in lieu of characterization (pursuant to section 51.1203(e)), please refer to the requirements below for submitting your final documentation for these sources.

Should you have any questions regarding these requirements, please contact any of our SO<sub>2</sub> staff, Twunjala Bradley or Steve Scofield, or my section chiefs Lynorae Benjamin or Heather Ceron. We will continue to work closely with you and your SO<sub>2</sub> staff to follow up on any questions you may have and provide additional information or clarifications, so please do not hesitate to contact EPA Region 4 throughout this current characterization process.

Here is the follow up information we currently are providing:



- For those DRR sources subject to a federally-enforceable control measure (such as a fuel switch or other control measures that may restrict emissions or shutdown certain units) lowering emissions below 2,000 tpy, the air agency can either establish an explicit SO<sub>2</sub> emission limit and/or provide specific permit conditions that result in a potential to emit (PTE) to below the DRR threshold. Any explicit SO<sub>2</sub> limit established should be based on a short term averaging-time (1-hour not to exceed 30-day) and cannot simply be an annual cap on emissions. The air agency must ensure that the limit is practicably enforceable (with appropriate compliance parameters).
- The air agency should thoroughly document in the permit how the explicit SO<sub>2</sub> limit or PTE reflect any permit conditions lowering emissions below 2,000 tpy. This includes documenting the permanent shutdown of specific units (i.e. demonstrating the portion of the permit authorizing operation of these units have been rescinded/revoked resulting in a zero PTE). These emission restrictions should be federally enforceable and effective by January 13, 2017. Additionally, where possible, Region 4 requests the review of any permit revisions/modifications.
- For those DRR sources that have indicated a permanent source-wide shutdown by January 13, 2017, explicit documentation through a federally-enforceable mechanism is required to show that the operating permit for that source has been rescinded and/or revoked, resulting in zero PTE.

R. Scott Davis

Chief, Air Planning and Implementation Branch

U.S. Environmental Protection Agency, Region 4

Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW

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Telephone: (404) 562-9127

email: [davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

<http://www.epa.gov/aboutepa/region4>

<http://www.southeastdiesel.org>



**To:** Alteri, Sean (EEC)[Sean.Alteri@ky.gov]; Benjamin, Lynorae[benjamin.lynorae@epa.gov]  
**Cc:** Quarles, Jackie (EEC)[Jackie.Quarles@ky.gov]  
**From:** Davis, Scott  
**Sent:** Wed 12/9/2015 6:14:15 PM  
**Subject:** RE: SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues

Thanks Sean – we missed that part since it was a follow on from our discussion with you and Louisville on the DRR.

R. Scott Davis

Chief, Air Planning and Implementation Branch

U.S. Environmental Protection Agency, Region 4

Sam Nunn Atlanta Federal Center, 61 Forsyth Street, SW

Atlanta, GA 30303-8960

Telephone: (404) 562-9127

email: [davis.scottr@epa.gov](mailto:davis.scottr@epa.gov)

<http://www.epa.gov/aboutepa/region4>

<http://www.southeastdiesel.org>

**From:** Alteri, Sean (EEC) [mailto:Sean.Alteri@ky.gov]  
**Sent:** Wednesday, December 09, 2015 1:07 PM  
**To:** Davis, Scott <Davis.ScottR@epa.gov>; Benjamin, Lynorae <benjamin.lynorae@epa.gov>  
**Cc:** Quarles, Jackie (EEC) <Jackie.Quarles@ky.gov>  
**Subject:** FW: SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues

Thanks for the call this afternoon, Scott and Lynorae.

I attempted to make it clear that the call included EKPC, along with the Division. Please see below.

Thanks,



Sean

**From:** Alteri, Sean (EEC)  
**Sent:** Monday, November 30, 2015 2:04 PM  
**To:** 'Bradley, Twunjala'  
**Cc:** Benjamin, Lynorae; Davis, Scott; Gillam, Rick; Rinck, Todd  
**Subject:** RE: SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues

Thank you. I appreciate the availability and look forward to the discussion.

**From:** Bradley, Twunjala [<mailto:Bradley.Twunjala@epa.gov>]  
**Sent:** Monday, November 30, 2015 1:58 PM  
**To:** Alteri, Sean (EEC)  
**Cc:** Benjamin, Lynorae; Davis, Scott; Gillam, Rick; Rinck, Todd  
**Subject:** RE: SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues

Hi Sean,

We're available for an additional conference to discuss the Cooper facility on December 9<sup>th</sup> immediately following the DRR. Please see the conference line information below.

Twunjala

Wednesday, December 9<sup>th</sup> – 11-12 EST

Call-in No.:  
Access Cod

**Ex. 6 - Personal Privacy**



**From:** Alteri, Sean (EEC) [<mailto:Sean.Alteri@ky.gov>]  
**Sent:** Monday, November 30, 2015 11:23 AM  
**To:** Walther, Katherine <[Walther.Katherine@epa.gov](mailto:Walther.Katherine@epa.gov)>; Garver, Daniel <[Garver.Daniel@epa.gov](mailto:Garver.Daniel@epa.gov)>; Gillam, Rick <[Gillam.Rick@epa.gov](mailto:Gillam.Rick@epa.gov)>; Bradley, Twunjala <[Bradley.Twunjala@epa.gov](mailto:Bradley.Twunjala@epa.gov)>; Howard, Chris <[Howard.Chris@epa.gov](mailto:Howard.Chris@epa.gov)>; Rinck, Todd <[Rinck.Todd@epa.gov](mailto:Rinck.Todd@epa.gov)>; Worley, Gregg <[Worley.Gregg@epa.gov](mailto:Worley.Gregg@epa.gov)>  
**Cc:** Quarles, Jackie (EEC) <[Jackie.Quarles@ky.gov](mailto:Jackie.Quarles@ky.gov)>; Bell, Jarrod (EEC) <[Jarrod.Bell@ky.gov](mailto:Jarrod.Bell@ky.gov)>; Shewekah, Rick (EEC) <[Rick.Shewekah@ky.gov](mailto:Rick.Shewekah@ky.gov)>; Duff, Melissa (EEC) <[melissa.duff@ky.gov](mailto:melissa.duff@ky.gov)>; [john.gowins@ky.gov](mailto:john.gowins@ky.gov); Cordes, Ben (EEC) <[Ben.Cordes@ky.gov](mailto:Ben.Cordes@ky.gov)>; [jenniferf.miller@ky.gov](mailto:jenniferf.miller@ky.gov); Davis, Kevin (EEC) <[Kevin.Davis@ky.gov](mailto:Kevin.Davis@ky.gov)>  
**Subject:** RE: SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues

Good morning.

In addition to the conference call with EPA, LMAPCD, and the Division, I would like to arrange a meeting with EPA, EKPC, and the Division to discuss the modeling demonstration currently under review by EPA for the Cooper facility. Last week, we met with EKPC to determine the modeling input files relative to the CAMD data.

Also, the "hybrid" approach and EPA's preliminary indication of its appropriate use was discussed. Their combined stack emissions and future allowable does present a unique situation. There are many citations in the NAAQS TAD that appear to be consistent with the approach used by EKPC. However, considering that the demonstration is under EPA review, I find it best for EPA and EKPC to communicate directly, with the Division included to carry out SIP and permit obligations.

If available, I propose a call with EPA, EKPC and the Division from 11:00 am to 12:00 pm on December 9, 2015, following the scheduled SO2 call. If this will not work, I propose that we use 30 minutes of the scheduled call to discuss the issues of EKPC. The two CD demonstrations will serve as a blueprint for the future demonstrations.



Thank you for your consideration.

Sean

Sean Alteri, Director

Division for Air Quality

200 Fair Oaks Lane, 1st Floor

Frankfort, Kentucky 40601

(502) 564-3999 ext 4400

(502) 564-4666 (fax)

<http://air.ky.gov>

-----Original Appointment-----

**From:** Duff, Melissa (EEC) **On Behalf Of** Walther, Katherine

**Sent:** Tuesday, November 24, 2015 2:30 PM

**To:** Walther, Katherine; Alteri, Sean (EEC); Garver, Daniel; Gillam, Rick; Bradley, Twunjala; Howard, Chris; Miller, Jennifer F (EEC); Gowins, John (EEC); [billy.dewitt@louisvilleky.gov](mailto:billy.dewitt@louisvilleky.gov); [josh.tennen@louisvilleky.gov](mailto:josh.tennen@louisvilleky.gov); Cordes, Ben (EEC); 'Rachael.Hamilton@louisvilleky.gov'; 'Paul.Aud@louisvilleky.gov'; Duff, Melissa (EEC)

**Cc:** Rinck, Todd

**Subject:** FW: SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues

**When:** Wednesday, December 09, 2015 10:00 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).

**Where:** TBD - call in:

**Ex. 6 - Personal Privacy**

Sean – please see below for those that will be attending the call from EPA. Are these the right



folks that need to speak with EKPC? Did you want me to arrange for that call as well or have Ben/Kevin arrange that?

-----Original Appointment-----

**From:** Walther, Katherine [<mailto:Walther.Katherine@epa.gov>]

**Sent:** Tuesday, November 24, 2015 10:25 AM

**To:** Walther, Katherine; Garver, Daniel; Gillam, Rick; Bradley, Twunjala; Howard, Chris; Miller, Jennifer F (EEC); Gowins, John (EEC); [billy.dewitt@louisvilleky.gov](mailto:billy.dewitt@louisvilleky.gov); [josh.tennen@louisvilleky.gov](mailto:josh.tennen@louisvilleky.gov); Cordes, Ben (EEC); 'Rachael.Hamilton@louisvilleky.gov'; 'Paul.Aud@louisvilleky.gov'; Duff, Melissa (EEC)

**Cc:** Rinck, Todd

**Subject:** SO2 Data Requirements Rule, Monitoring and Modeling Technical Issues

**When:** Wednesday, December 09, 2015 10:00 AM-11:00 AM (UTC-05:00) Eastern Time (US & Canada).

**Where:** TBD - call in:

**Ex. 6 - Personal Privacy**

Please forward this invite to anyone else that you would like on the call:

In preparation for the upcoming Data Requirements Rule (DRR) deadlines, we (the EPA Region 4 monitoring and modeling team) would like to schedule a call with you to discuss the following:

- The general timeline for the upcoming deadlines outlined in the DRR
- For SO<sub>2</sub> sources that you are already planning or working to characterize:
- Do you have any questions on the specifics of the monitoring or modeling plans on the work that you have completed so far?
- Are there any expected complex technical issues associated with the monitoring/modeling of specific sources?
- Are you expecting to submit alternative model requests?
- Monitoring technical questions
- An overview of the Monitoring and Modeling Technical Assistance Documents
- QA system for Industrial monitoring (if you are planning to use industrial monitors to comply with the DRR).
- Any questions you have on the overall process



Ideally we would like to have staff from the monitoring, modeling, and SIP groups from Kentucky Division for Air Quality and Louisville Metro Air Pollution Control District participate in the call.



**To:** Donaldson, Guy[Donaldson.Guy@epa.gov]; Spencer, Stuart[SPENCER@adeq.state.ar.us]  
**Cc:** Stenger, Wren[stenger.wren@epa.gov]; keogh@adeq.state.ar.us[keogh@adeq.state.ar.us];  
Montgomery, William[Montgomery@adeq.state.ar.us]; McCorkle, Mark[MAC@adeq.state.ar.us];  
Coleman, Sam[Coleman.Sam@epa.gov]; Gray, David[gray.david@epa.gov]  
**From:** Clark, David  
**Sent:** Tue 1/17/2017 2:17:15 PM  
**Subject:** RE: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of  
Arkansas (Independence County Report)

Guy,  
Sorry for the multiple emails. Because of email attachment size restrictions, I just sent you the body of the  
Independence County report in one email and the appendices in a second email. Could you please  
confirm with us that you successfully received both attachments.

David

David W. Clark, M.S.  
Epidemiologist  
Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR. 72118  
U.S.A.  
Voice: 501 682-0070  
Fax: 501 682-0753

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reply e-mail and destroy all copies of the original message.

-----Original Message-----

From: Donaldson, Guy [mailto:Donaldson.Guy@epa.gov]  
Sent: Friday, January 13, 2017 4:35 PM  
To: Spencer, Stuart  
Cc: Stenger, Wren; Keogh, Becky; Montgomery, William; McCorkle, Mark; Coleman, Sam; Gray, David;  
Clark, David  
Subject: RE: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of  
Arkansas (Independence County Report)

Stuart,

I don't see anything attached.

-----Original Message-----

From: Spencer, Stuart [mailto:SPENCER@adeq.state.ar.us]  
Sent: Friday, January 13, 2017 2:15 PM  
To: Donaldson, Guy <Donaldson.Guy@epa.gov>  
Cc: Stenger, Wren <stenger.wren@epa.gov>; keogh@adeq.state.ar.us; Montgomery, William  
<Montgomery@adeq.state.ar.us>; McCorkle, Mark <MAC@adeq.state.ar.us>; Coleman, Sam  
<Coleman.Sam@epa.gov>; Gray, David <gray.david@epa.gov>; Clark, David  
<CLARKD@adeq.state.ar.us>  
Subject: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of  
Arkansas (Independence County Report)



Importance: High

Guy,

Please find attached the Independence County modeling report (Entergy Independence facility and FutureFuel Chemical Company).

If you have any questions, please don't hesitate to contact me.

Sincerely,

Stuart Spencer

Associate Director- Office of Air Quality Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR 72118

Ph. # (501) 682-0750

Fax # (501) 682-0880

E-mail: [SPENCER@adeq.state.ar.us](mailto:SPENCER@adeq.state.ar.us)

Web: <http://www.adeq.state.ar.us>

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**From:** Verhalen, Frances  
**Location:** R6-ConfRm-CypressTree-06O02@epa.gov  
**Importance:** Normal  
**Subject:** ODEQ call SO2: Oxbow Facility  
**Start Date/Time:** Wed 3/16/2016 3:00:00 PM  
**End Date/Time:** Wed 3/16/2016 4:00:00 PM

## **Ex. 6 - Personal Privacy**

From Kent Stafford:

*All,*

*Would you have time available on Wednesday, March 16 for a brief conference call regarding the ANR (Annual Network Review) as it relates to potential new sites required for the SO2 Data Requirements Rule? We have met with the Oxbow facility and have some questions relative to incorporation of the monitoring and modeling plans into the review. It appears that our folks will be available any time that day. Thanks.*

*Kent*



**From:** Hansen, Mark  
**Location:** R6-ConfRm-PineTree-06O15 <R6-ConfRm-PineTree-06O15@epa.gov>  
**Importance:** Normal  
**Subject:** SO2 Modeling from NRG  
**Start Date/Time:** Thur 10/15/2015 3:00:00 PM  
**End Date/Time:** Thur 10/15/2015 5:00:00 PM

Teleconference Info Ex. 6 - Personal Privacy Conference Code Ex. 6 - Personal Privacy

SO2 modeling 1 hour NAAQS will be submitted by September 18

Limestone and Parish Units

Also Big Cajun 114 BART 5 Factor analysis questions

Craig Eckberg and Matt Kuryla in person



**To:** beverly.botchlet-smith@deq.state.ok.us[beverly.botchlet-smith@deq.state.ok.us];  
cheryl.bradley@deq.state.ok.us[cheryl.bradley@deq.state.ok.us];  
dbrymer@tceq.state.tx.us[dbrymer@tceq.state.tx.us];  
eddie.terrell@deq.state.ok.us[eddie.terrell@deq.state.ok.us]; Fmacias@cabq.gov[Fmacias@cabq.gov];  
ltavarez@cabq.gov[ltavarez@cabq.gov]; Nieto, Margaret E.[mnieto@cabq.gov];  
rheaume@adeq.state.ar.us[rheaume@adeq.state.ar.us];  
richard.goodyear@state.nm.us[richard.goodyear@state.nm.us];  
rita.bates@state.nm.us[rita.bates@state.nm.us]; Vivian Aucoin[Vivian.Aucoin@LA.GOV]; Spencer,  
Stuart[SPENCER@adeq.state.ar.us]; Montgomery, William[Montgomery@adeq.state.ar.us]; Donald  
Trahan[Donald.Trahan@LA.GOV]; vennetta.hayes@la.gov[vennetta.hayes@la.gov]  
**Cc:** Snyder, Erik[snyder.erik@epa.gov]; Feldman, Michael[Feldman.Michael@epa.gov]; Imhoff,  
Robert[imhoff.robert@epa.gov]; Mohr, Ashley[Mohr.Ashley@epa.gov]  
**From:** Donaldson, Guy  
**Sent:** Thur 3/9/2017 7:14:51 PM  
**Subject:** FW: Memorandum/Clarification on the AERMOD Modeling System Version for Use in SO2  
Implementation Efforts and Other Regulatory Actions  
[image2017-03-09-090929.pdf](#)

FYI



**To:** Spencer, Stuart[SPENCER@adeq.state.ar.us]  
**Cc:** Clark, David[CLARKD@adeq.state.ar.us]; Montgomery, William[Montgomery@adeq.state.ar.us]  
**Sent:** Tue 1/17/2017 3:00:47 PM  
**Subject:** RE: Flint Creek and Plum Point

Still no go.

Since the problem is on our end, let me find out a

-----Original Message-----

From: Spencer, Stuart [mailto:SPENCER@adeq.state.ar.us]  
Sent: Tuesday, January 17, 2017 8:59 AM  
To: Donaldson, Guy <Donaldson.Guy@epa.gov>  
Cc: Clark, David <CLARKD@adeq.state.ar.us>; Montgomery, William <Montgomery@adeq.state.ar.us>  
Subject: Flint Creek and Plum Point

Morning! Hope these go through. If not, let me know.

Stuart

-----Original Message-----

From: Clark, David  
Sent: Tuesday, January 17, 2017 8:53 AM  
To: Spencer, Stuart; Montgomery, William; McCorkle, Mark  
Subject: RE: Plum Point

Here are both reports as compressed files with a combined total of 3MB so they should be able to be emailed to anyone without any problem.

David

David W. Clark, M.S.  
Epidemiologist  
Air Division – Planning & Air Quality Analysis Branch Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR. 72118  
U.S.A.  
Voice: 501 682-0070  
Fax: 501 682-0753

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-----Original Message-----

From: Spencer, Stuart  
Sent: Tuesday, January 17, 2017 8:48 AM  
To: Clark, David; Montgomery, William  
Subject: FW: Plum Point  
Importance: High

Can you guys work on breaking up the Flint Creek and Plum Point files to send to Guy? I was able to break Independence up into six parts on Friday. All parts went through.



Thanks!

Stuart

-----Original Message-----

From: Donaldson, Guy [mailto:Donaldson.Guy@epa.gov]  
Sent: Monday, January 16, 2017 8:30 AM  
To: Spencer, Stuart  
Subject: RE: Plum Point

Neither Flint Creek nor Plum Point came through.

-----Original Message-----

From: Spencer, Stuart [mailto:SPENCER@adeq.state.ar.us]  
Sent: Friday, January 13, 2017 5:07 PM  
To: Donaldson, Guy <Donaldson.Guy@epa.gov>  
Subject: Plum Point  
Importance: High

Going to try one more time for Plum Point.

-----Original Message-----

From: Spencer, Stuart  
Sent: Friday, January 13, 2017 2:12 PM  
To: 'Donaldson, Guy (Donaldson.Guy@epa.gov)'  
Cc: 'Stenger, Wren (stenger.wren@epa.gov)'; Keogh, Becky; Montgomery, William; McCorkle, Mark; 'Coleman.Sam@epa.gov'; 'gray.david@epa.gov'; Clark, David  
Subject: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas  
Importance: High

Guy,

I am pleased to attach for your review and consideration ADEQ's letter recommending an "unclassifiable/attainment" designation for Benton, Independence, and Mississippi Counties, as well as the accompanying modeling reports for the facilities in each of those counties with SO2 emissions greater than the EPA-determined threshold for review. I am attaching the reports for Plum Point and Flint Creek to this e-mail. I will send the Independence County report (Entergy Independence facility and FutureFuel Chemical Company) separately due to its size. An official Governor's letter will follow.

I appreciate our call on this issue earlier this week. Thank you, again, for your guidance and assistance.

Sincerely,

Stuart Spencer

Associate Director- Office of Air Quality Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR 72118  
Ph. # (501) 682-0750  
Fax # (501) 682-0880  
E-mail: SPENCER@adeq.state.ar.us  
Web: <http://www.adeq.state.ar.us>



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**From:** Medina, Dayana  
**Location:** R6-ConfRm-PineTree-06O15  
**Importance:** Normal  
**Subject:** Call with ODEQ to discuss SO2 Designations  
**Start Date/Time:** Thur 2/25/2016 7:00:00 PM  
**End Date/Time:** Thur 2/25/2016 8:00:00 PM  
[2010 SO2 NAAQS Designations.docx](#)

Call in number is Ex. 6 - Personal Privacy conference code Ex. 6 - Personal Privacy

Attached is a list of questions from ODEQ that we will be discussing on the call.



**To:** Donaldson, Guy[Donaldson.Guy@epa.gov]  
**Cc:** McCorkle, Mark[MAC@adeq.state.ar.us]  
**From:** Clark, David  
**Sent:** Tue 5/24/2016 1:40:10 PM  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Good morning Guy,

I'm contacting to inquire about the status of the AERMOD protocol/Clearinghouse request we submitted as part of our SO2 designations work for Independence County. Do you know or could you please see where this stands?

Thank you in advance for any information,

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

U.S.A.

Voice: 501 682-0070

Fax: 501 682-0753

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**From:** Clark, David  
**Sent:** Friday, April 29, 2016 8:55 AM



**To:** 'Donaldson, Guy'; Snyder, Erik  
**Cc:** McCorkle, Mark; Spencer, Stuart  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Hello Guy & Erik,

Attached find a SO2 NAAQS designation AERMOD protocol/Clearinghouse request for Independence County, Arkansas that ADEQ is submitting in response to Ron Curry's February 11, 2016 letter to Arkansas' Governor Hutchinson (also attached) regarding the insufficient information for an Unclassifiable/Attainment SO2 NAAQS designation for Independence County. We have also sent this protocol/Clearinghouse request to both of you as a hardcopy document via postal mail.

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

U.S.A.

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**From:** Donaldson, Guy [<mailto:Donaldson.Guy@epa.gov>]  
**Sent:** Thursday, April 21, 2016 1:06 PM



**To:** Clark, David; Snyder, Erik  
**Cc:** McCorkle, Mark  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Thx for the heads up.

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]  
**Sent:** Thursday, April 21, 2016 9:26 AM  
**To:** Donaldson, Guy; Snyder, Erik  
**Cc:** McCorkle, Mark  
**Subject:** EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Good morning Guy & Erik,

I'm sending this correspondence as follow-up to Ron Curry's February 11, 2016 letter to Arkansas' Governor Hutchinson regarding the insufficient information for an Unclassifiable/Attainment SO2 NAAQS designation for Independence County, Arkansas and the stated opportunity for ADEQ to submit additional information. As you will recall, this letter prompted a February 29, 2016 phone conversation that included EPA R6, the Model Clearinghouse, ADEQ, FutureFuel Chemical Company (FutureFuel) and Entergy Arkansas Independence Steam Electrical Station (Entergy) where a combined FutureFuel/Entergy AERMOD dispersion analysis and a potential Model Clearinghouse submittal was discussed. From FutureFuel, ADEQ has received, reviewed and intends to forward to EPA R6 for consideration a modeling protocol and Clearinghouse request to employ ADJ\_U\* in a combined FutureFuel/Entergy AERMOD dispersion analysis.

This protocol/request is awaiting the signature of ADEQ's Office of Air Quality Associate Director, Stuart Spencer, who is out of the office this week at a conference and will return Monday April 25, 2016. With Stuart's return next week we anticipate forwarding this protocol/request to both of you for consideration and desired concurrence submittal to the Model Clearinghouse. Please accept this message as an update to keep you abreast of our progress with



this endeavor and I will follow-up with both of you next week.

Thank you in advance for your assistance,

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

U.S.A.

Voice: 501 682-0070

Fax: 501 682-0753

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**To:** Donaldson, Guy[Donaldson.Guy@epa.gov]; Snyder, Erik[snyder.erik@epa.gov]  
**Cc:** McCorkle, Mark[MAC@adeq.state.ar.us]; Spencer, Stuart[SPENCER@adeq.state.ar.us]  
**From:** Clark, David  
**Sent:** Fri 4/29/2016 1:55:06 PM  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation  
[Modeling Clearinghouse Letter & Trinity Doc Submitted.pdf](#)  
[EPA SO2 to AR Letter Additional Info.pdf](#)

Hello Guy & Erik,

Attached find a SO2 NAAQS designation AERMOD protocol/Clearinghouse request for Independence County, Arkansas that ADEQ is submitting in response to Ron Curry's February 11, 2016 letter to Arkansas' Governor Hutchinson (also attached) regarding the insufficient information for an Unclassifiable/Attainment SO2 NAAQS designation for Independence County. We have also sent this protocol/Clearinghouse request to both of you as a hardcopy document via postal mail.

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

U.S.A.

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**From:** Donaldson, Guy [mailto:Donaldson.Guy@epa.gov]  
**Sent:** Thursday, April 21, 2016 1:06 PM  
**To:** Clark, David; Snyder, Erik  
**Cc:** McCorkle, Mark  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Thx for the heads up.

**From:** Clark, David [mailto:CLARKD@adeq.state.ar.us]  
**Sent:** Thursday, April 21, 2016 9:26 AM  
**To:** Donaldson, Guy; Snyder, Erik  
**Cc:** McCorkle, Mark  
**Subject:** EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Good morning Guy & Erik,

I'm sending this correspondence as follow-up to Ron Curry's February 11, 2016 letter to Arkansas' Governor Hutchinson regarding the insufficient information for an Unclassifiable/Attainment SO2 NAAQS designation for Independence County, Arkansas and the stated opportunity for ADEQ to submit additional information. As you will recall, this letter prompted a February 29, 2016 phone conversation that included EPA R6, the Model Clearinghouse, ADEQ, FutureFuel Chemical Company (FutureFuel) and Entergy Arkansas Independence Steam Electrical Station (Entergy) where a combined FutureFuel/Entergy AERMOD dispersion analysis and a potential Model Clearinghouse submittal was discussed. From FutureFuel, ADEQ has received, reviewed and intends to forward to EPA R6 for consideration a modeling protocol and Clearinghouse request to employ ADJ\_U\* in a combined FutureFuel/Entergy AERMOD dispersion analysis.

This protocol/request is awaiting the signature of ADEQ's Office of Air Quality Associate Director, Stuart Spencer, who is out of the office this week at a conference and will return



Monday April 25, 2016. With Stuart's return next week we anticipate forwarding this protocol/request to both of you for consideration and desired concurrence submittal to the Model Clearinghouse. Please accept this message as an update to keep you abreast of our progress with this endeavor and I will follow-up with both of you next week.

Thank you in advance for your assistance,

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

U.S.A.

Voice: 501 682-0070

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April 27, 2016

Guy Donaldson  
Chief, Air Planning Section  
U.S. EPA Region 6  
1445 Ross Avenue, Suite 1200  
Dallas, Texas 75202-2733

Subject: Request to Use the Adjusted\_U\* Beta Option for the FutureFuel Chemical Company 1-Hour SO<sub>2</sub> NAAQS Modeling Project

Dear Mr. Donaldson:

Through this letter, the Arkansas Department of Environmental Quality (ADEQ) is asking the U.S. Environmental Protection Agency (U.S. EPA) Region 6 (R6) to allow FutureFuel Chemical Company (FutureFuel) sited within Independence County, Arkansas to use EPA's proposed algorithm for adjusting the friction velocity (ADJ\_U\*) within the AERMOD Modeling System. When AERMOD is run with a meteorological dataset derived from one-minute meteorological data, as is currently recommended by the U.S. EPA, low wind speeds are more prevalent than when the modeling system did not rely on one-minute meteorological data. The more frequent inclusion of data that includes low wind speeds have been linked to potential underestimates of friction velocity (U\*) in AERMET and therefore, overestimates in ambient concentrations by AERMOD.<sup>1</sup> The U.S. EPA recognized this potential underestimation in AERMET and released AERMET Version 12345 which included the beta option, ADJ\_U\* and on July 29, 2015 the EPA also proposed the ADJ\_U\* algorithm as part of a revision to their Appendix W of 40 CFR Part 51, *Guideline on Air Quality Models* (Appendix W). The ADJ\_U\* beta option allows the friction velocity to be adjusted to better account for turbulence in the atmosphere during low wind speed stable conditions.

On June 3, 2010, the U.S. EPA set a 1-hour "primary" National Ambient Air Quality Standard for SO<sub>2</sub> at 75 parts per billion (ppb). On August 21, 2015, the U.S. EPA promulgated the 1-hour Sulfur Dioxide (SO<sub>2</sub>) Data Requirements Rule (DRR) whereby states use predictive dispersion modeling or monitoring to evaluate specific contributors of SO<sub>2</sub> whose annual emissions exceed 2,000 tons per year (tpy). On January 8, 2016, ADEQ submitted a letter to the U.S. EPA R6 identifying sources as required by the SO<sub>2</sub> DRR that included FutureFuel with actual emissions of 3,174.31 tpy (2014 reporting year). Based on dispersion modeling, on September 11, 2015, ADEQ submitted 2010 SO<sub>2</sub> 1-hour NAAQS designations to the U.S. EPA R6. On February 11, 2016, ADEQ received a response from the U.S. EPA R6 outlining the U.S. EPA's preliminary

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<sup>1</sup> Wenjun Qian and Akula Venkatram, "Performance of Steady State Dispersion Models Under Low Wind-Speed Conditions," *Boundary-Layer Meteorology*, no. 138 (2011): 475-491.



response to identify Independence County, Arkansas as Unclassifiable based on insufficient information for a determination. To this end, FutureFuel and Entergy Independence Steam Electrical Station (Entergy), along with ADEQ, have undertaken a combined SO<sub>2</sub> predictive dispersion modeling project that considers both FutureFuel and Entergy emissions in the analysis.

Arkansas Regulation 19.412(A) requires applications of air quality modeling to be based on the requirements of Appendix W and 19.412(B) requires the applicant to receive written approval from the EPA for any modification or substitution. Section 3.2.2.b of Appendix W requires that the alternative approach is more appropriate than the preferred air quality model and also states that the request must meet at least one of three conditions, which are summarized below:

1. The alternative and preferred model provide equivalent estimates;
2. The alternative model outperforms the preferred model when comparing the results to actual air quality data; or
3. The preferred model is less appropriate or there is no preferred model for the given scenario.

As described in detail in FutureFuel's April 13, 2016 request to ADEQ (enclosed), ADEQ, FutureFuel and Entergy believe this request to the U.S. EPA meets the third criteria of Appendix W, Section 3.2.2.b. Because the U.S. EPA has noted that AERMOD has the potential to overestimate ambient concentrations during low wind speed conditions and has been developing the ADJ\_U\* algorithm since at least 2012 to help mitigate the problem, the U.S. EPA has now formally proposed the use of this algorithm on a routine basis<sup>2</sup> and has conducted a number of modeled to measured comparisons to support their proposal making the preferred model less appropriate for this situation. Appendix W, Section 3.2.2.e provides five criteria that must be met to use an alternative refined model. FutureFuel, Entergy and ADEQ have reviewed these five criteria and believe that within the context of this modeling project, applying ADJ\_U\* in AERMOD to produce a meteorological file to be used in AERMOD will produce valid and more representative results for the modeling domain in the vicinity of the facility.

The detailed responses to each of the five criteria in Section 3.2.2.e are provided in Appendix A of FutureFuel's April 13, 2016 request to ADEQ. For 3.2.2.e.i (Scientific Peer Review), the use of an adjusted friction velocity in AERMOD has received substantial scientific peer review both within the U.S. EPA as well as by others in the scientific community. Regarding 3.2.2.e.ii (Applicable On A Theoretical Basis), when the threshold velocities of the National Weather Service anemometers were 1 meter per second (m/s) and greater the modeling community began to recognize that winds lower than 1 m/s would result in ambient concentration estimates that were not in line with ambient monitored values under the same conditions and that concentrations were inversely proportional to wind speed which greatly increased impacts at wind speeds below 1 m/s. More recently, many scientific studies have noted that Gaussian dispersion models tend to over predict concentrations at low wind speeds. To address 3.2.2.e.iii (Availability Of Databases), the databases applicable to this discussion are available and adequate. Section 3.2.2.e.iv (Demonstration Of No Bias Towards

---

<sup>2</sup> [https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR\\_AppendixW\\_Proposal.pdf](https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR_AppendixW_Proposal.pdf)



Underestimates) is buttressed by a number of studies, including a U.S. EPA model performance evaluation, that show that the use of ADJ\_U\* has not shown any bias toward underestimating the ambient concentrations. For Section 3.2.2.e.v (A Protocol Has Been Established), the enclosed document serves as the modeling protocol and clearly identifies all of the data resources and modeling methodology being proposed for use in the before-mentioned SO2 Attainment analysis.

For the reasons described above and elaborated on in FutureFuel's request, please grant permission to use the ADJ\_U\* option in an ambient demonstration to be conducted in support of ADEQ's September 11, 2015 submittal of 2010 Sulfur dioxide (SO<sub>2</sub>) 1-hour NAAQS designations to the EPA.

If you have any questions regarding this request, please contact me at (501) 683-0873 or [spencer@adeq.state.ar.us](mailto:spencer@adeq.state.ar.us) or Mark McCorkle at (501) 682-0736 or [mac@adeq.state.ar.us](mailto:mac@adeq.state.ar.us).

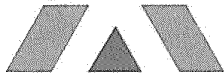
Sincerely,

A handwritten signature in black ink, appearing to read 'Stuart Spencer', with a long horizontal line extending to the right.

Stuart Spencer  
Associate Director  
Office of Air Quality  
Arkansas Department of Environmental Quality

cc: Erik Snyder, U.S. EPA Region 6





11225 Huron Lane | Suite 212 | Little Rock, AR 72211 | P (501) 225-6400 | F (501) 325-4488

trinityconsultants.com



VIA E-MAIL TO: [mac@adeq.state.ar.us](mailto:mac@adeq.state.ar.us)

April 13, 2016

Mark McCorkle  
Environmental Program Coordinator  
ADEQ, Office of Air Quality – Planning Branch  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

RE: *FutureFuel Chemical Company (AFIN: 32-00036)*  
*1-Hour SO<sub>2</sub> NAAQS Modeling Protocol*

Dear Mr. McCorkle:

FutureFuel Chemical Company (FutureFuel) is a supplier of specialty organic chemical intermediates used in various manufacturing processes, and is located in Batesville, Arkansas. Per our recent discussions, FutureFuel has prepared the enclosed modeling protocol detailing how the 1-hour SO<sub>2</sub> NAAQS Attainment Demonstration will be conducted. The document is being provided for ADEQ's review and approval. Per our February 29 conference call with you and U.S. EPA, justification for the use of AERMOD model beta options, i.e., ADJ\_U\* met data, is included in Appendix A of the protocol.

FutureFuel is requesting that ADEQ provide written approval of this modeling protocol at their earliest convenience. Additionally, FutureFuel understands that ADEQ will submit the protocol to EPA for approval, including EPA Modeling Clearinghouse approval of the beta options. FutureFuel requests that we be copied on all correspondence to/from EPA regarding questions, comments, and approval of the protocol.

If you have any questions or comments about the information presented in this letter, please do not hesitate to contact me at (501) 225-6400 or via e-mail to [cbuttry@trinityconsultants.com](mailto:cbuttry@trinityconsultants.com).

Sincerely,

TRINITY CONSULTANTS

Charles R. (Chuck) Buttry  
Regional Manager, Southeast

Enclosure: 1-Hour SO<sub>2</sub> NAAQS Modeling Protocol

cc: Mr. Philip Antici, FutureFuel Chemical Company ([philipantici@ffcmail.com](mailto:philipantici@ffcmail.com))  
Ms. Ann Faitz, Faitz Law Firm ([annfaitz@faitzlawfirm.com](mailto:annfaitz@faitzlawfirm.com))

HEADQUARTERS >  
12770 Merit Drive | Suite 900 | Dallas, TX 75251 | P (972) 661-8100 | F (972) 385-9203

USA | China | Middle East





# 1-HOUR SO<sub>2</sub> NAAQS MODELING PROTOCOL

FutureFuel Chemical Company

Batesville, Arkansas

AFIN 32-00036



Prepared By:

Charles R. (Chuck) Buttry – Regional Manager, Southeast

Brian Holland – Senior Scientific Software Specialist

Jonathan Hill – Managing Consultant

Sarah Haley – Consultant

**TRINITY CONSULTANTS**

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## 1. INTRODUCTION

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Under the final U.S. Environmental Protection Agency (EPA) Sulfur Dioxide (SO<sub>2</sub>) Data Requirements Rule (DRR) promulgated on August 21, 2015, state air agencies will seek SO<sub>2</sub> predictive modeling or actual monitoring information for categories of sources based on annual SO<sub>2</sub> emission rates. The focus of the final DRR is on areas with sources whose actual annual SO<sub>2</sub> emissions exceed 2,000 tons per year (tpy). EPA's rationale for using predictive dispersion modeling is the dearth of representative ambient SO<sub>2</sub> monitors and EPA's view that SO<sub>2</sub> is a "source-oriented" criteria pollutant that is relatively stable in the first few kilometers from the source. Thus, this rule directs agencies to focus on specific sources as the main contributors to SO<sub>2</sub> air quality impacts and the way to ascertain those potential source contributions will be through dispersion modeling.

On January 8, 2016, the Arkansas Department of Environmental Quality (ADEQ) submitted a letter to EPA Region 6 regarding SO<sub>2</sub> sources identified pursuant to 40 CFR 51.1202 as required by the DRR for the 1-hour SO<sub>2</sub> National Ambient Air Quality Standard (NAAQS). ADEQ identified FutureFuel Chemical Company (FutureFuel) as a source with actual annual SO<sub>2</sub> emissions of 2,000 tons or more for the 2014 reporting year (i.e., 3,174.31 tpy).

FutureFuel contracted with Trinity Consultants to prepare an SO<sub>2</sub> modeling protocol and complete an SO<sub>2</sub> modeling analysis according to the DRR. Per FutureFuel's discussion with the ADEQ, the FutureFuel modeling analysis will include the actual SO<sub>2</sub> emissions from the nearby Entergy Independence Steam Electric Station (Entergy). According to the March 2, 2015, agreement (Consent Decree) between U.S. EPA and environmental groups, ADEQ was required to designate the area around Entergy plant "early" (no later than July 2, 2016) since Entergy's Independence Station met the Consent Decree criteria. In support of this early designation, Entergy completed a modeling analysis of solely the Independence Station and submitted the results to ADEQ in the *SO<sub>2</sub> Air Dispersion Modeling Report for Independence Steam Electric Station, ERM Project No. 0268066*, dated August 2015 (the August 2015 report). On September 11, 2015, Governor Hutchinson recommended to EPA that Independence County be designated as "Unclassifiable/Attainment". This recommendation was based on the Entergy modeling analysis. Per ADEQ's request, FutureFuel will complete a combined SO<sub>2</sub> modeling analysis, considering both FutureFuel and Entergy emissions in their analysis.

The 1-hour SO<sub>2</sub> characterization modeling will adhere to the following guidance documents: the February 2016 "SO<sub>2</sub> NAAQS Designations Modeling Technical Assistance Document" (TAD) issued in draft form by the EPA, the final DRR for the 2010 1-hour SO<sub>2</sub> primary NAAQS, and any direction received from the ADEQ Air Division Planning Branch. The 1-hour SO<sub>2</sub> characterization modeling will be conducted using AERMOD (version 15181) using default model options (unless otherwise noted in this document), meteorological data from 2012-2014 as described in Section 3.5, and the actual 2012-2014 emissions rates discussed in Section 3.3. Modeled concentrations will be predicted over the extensive receptor grid described in Section 3.6, and will include an ambient background concentration as described in Section 3.4.

The modeled concentrations predicted by AERMOD (including background) will be calculated based on the form of the 1-hour SO<sub>2</sub> NAAQS. The total design concentration will be compared to the 1-hour SO<sub>2</sub> primary NAAQS to determine if the area surrounding FutureFuel and Entergy should be designated as attainment or non-attainment.

The results of the analysis will be documented in a report submitted to ADEQ, which will also include a complete electronic modeling archive on CD.



## 2. FACILITY DESCRIPTION

This section presents a description of the FutureFuel facility location and site characteristics required as part of the air dispersion modeling evaluation.

### 2.1. FACILITY LOCATION

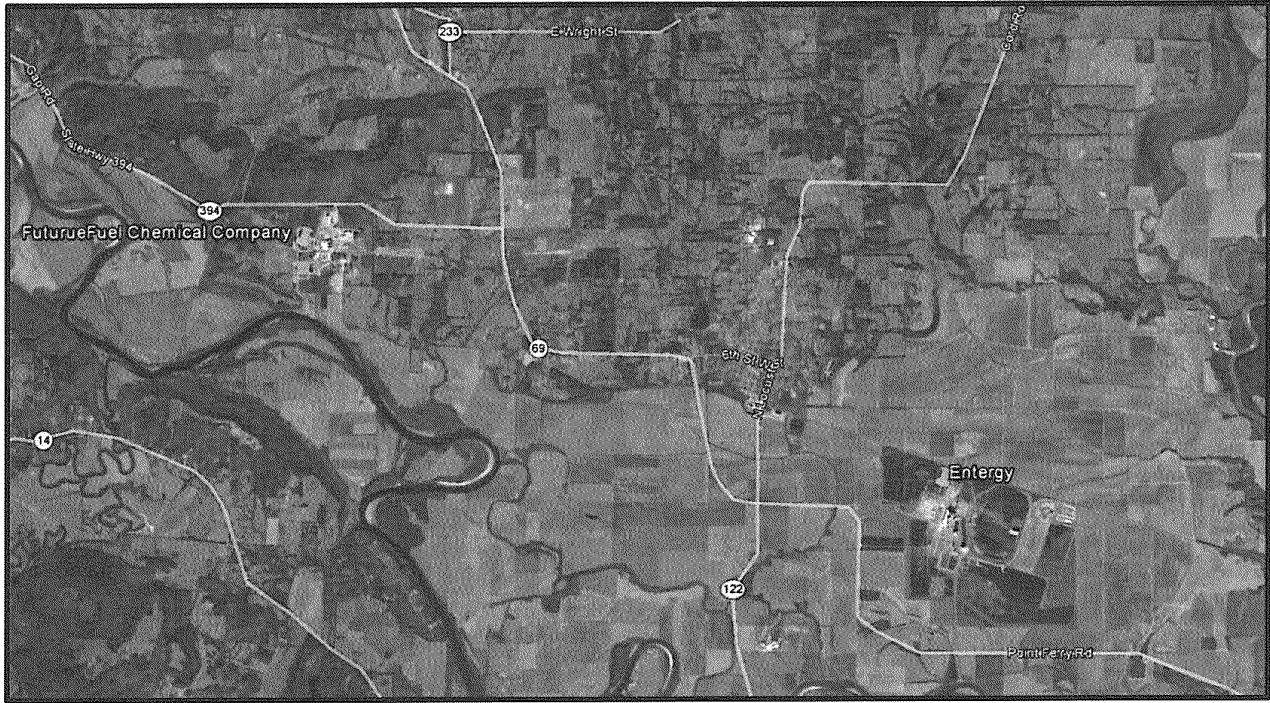
FutureFuel is located approximately 12 kilometers (km) southeast of Batesville in Independence County, Arkansas. Figure 2-1 provides a map of the area surrounding FutureFuel's property. The approximate central Universal Transverse Mercator (UTM) coordinates of the facility are 633,080 meters (m) east and 3,953,700 m north in Zone 15 [North American Datum 1983 (NAD 83)]. As shown in Figure 2-1, the facility is located in a very rural area of the White River valley, comprised of mixed forest and agricultural land with flat, rolling and hilly terrain all nearby.



Figure 2-1. Aerial Map of Area Surrounding FutureFuel Facility



Figure 2-2 shows the relative locations of FutureFuel and Entergy. Entergy is located approximately 11.4 kilometers southeast of FutureFuel and is in an area of generally flat terrain.



**Figure 2-2 Relative Locations of FutureFuel and Entergy**

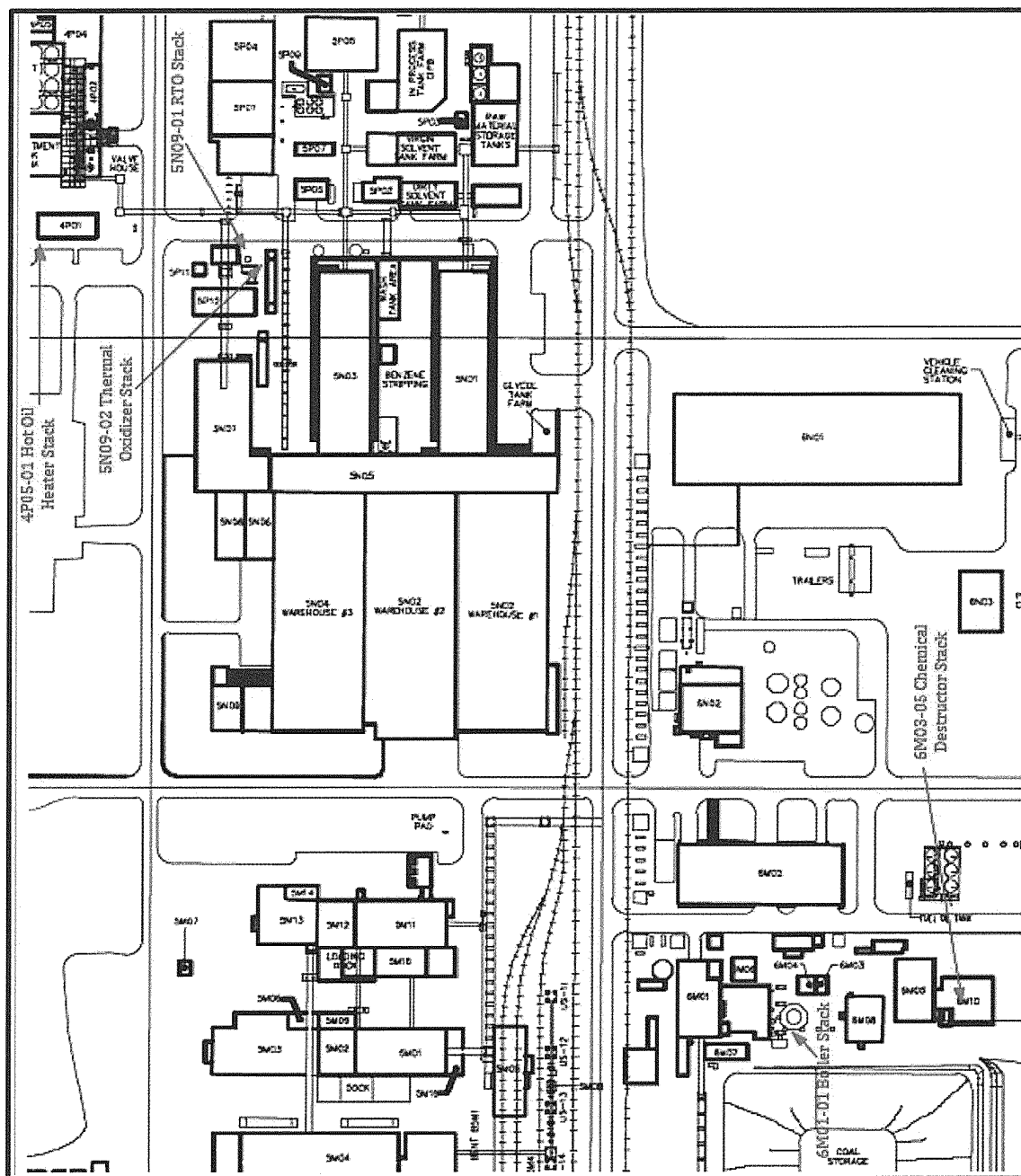
Figure 2-3 shows an aerial map of FutureFuel with the SO<sub>2</sub> sources labeled. Figure 2-4 presents a plot plan of FutureFuel showing the major buildings and SO<sub>2</sub> sources. Refer to Entergy's August 2015 report for more details about their site and SO<sub>2</sub> emissions.





**Figure 2-3. Aerial Map of FutureFuel Facility**





### Figure 2-4. Future Fuel Plot Plan

FutureFuel Chemical Company | 1-Hour SO<sub>2</sub> NAAQS Modeling Protocol  
Trinity Consultants



### 3. DISPERSION MODELING ANALYSIS

---

This section presents the input data and modeling methodology that will be utilized in the SO<sub>2</sub> NAAQS modeling demonstration. The modeling methodology generally conforms to the Modeling TAD.<sup>1</sup>

#### 3.1. MODEL SELECTION

Modeling will be performed for the 1-hour SO<sub>2</sub> analysis following the Modeling TAD. The AERMOD Model Version 15181<sup>2</sup>, the most current version released by EPA on July 24, 2015 on the Support Center for Regulatory Air Modeling (SCRAM) website<sup>3</sup>, will be used to perform the dispersion modeling. The proposed update to EPA's modeling guidance in the form of the *Guideline on Air Quality Models*<sup>4</sup>, was released on July 15, 2015 via the EPA technical website.<sup>5</sup>

#### 3.2. SOURCE DESCRIPTION

All SO<sub>2</sub> emitting sources at FutureFuel will be modeled except for five very small SO<sub>2</sub> sources (less than 3.8 lb/hr total) and per EPA's clarification memorandum, intermittent emergency sources such as an emergency diesel-fired generator and fire water pump engines.<sup>6</sup> The modeled sources account for 98.5% of allowable SO<sub>2</sub> emissions from the facility. Additionally, SO<sub>2</sub> emitting sources from the nearby Entergy plant will be modeled. Table 3-1 presents a table of the sources that will be modeled and their locations. All locations are expressed in UTM Zone 15 coordinates.

---

<sup>1</sup> <https://www3.epa.gov/airquality/sulfurdioxide/pdfs/SO2ModelingTAD.pdf>

<sup>2</sup> Stated by U.S. EPA to be part of the docket at Docket ID No. EPA-HQ-OAR-2015-0310 and available as of date of submittal of this report.

<sup>3</sup> [http://www.epa.gov/ttn/scram/dispersion\\_prefrec.htm#aermod](http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod)

<sup>4</sup> *Guideline on Air Quality Models*. Appendix W to 40 CFR Parts 51 and 52. Federal Register, November 9, 2005. pp. 68217-68261.

<sup>5</sup> [https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR\\_AppendixW\\_Proposal.pdf](https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR_AppendixW_Proposal.pdf)

<sup>6</sup> [https://www3.epa.gov/ttn/scram/guidance/clarification/Additional\\_Clarifications\\_AppendixW\\_Hourly-NO2-NAAQS\\_FINAL\\_03-01-2011.pdf](https://www3.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-NO2-NAAQS_FINAL_03-01-2011.pdf)



**Table 3-1. Modeled Source Locations**

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
FF_5N091	RTO	633,660.39	3,953,915.79	81.94
FF_6M01	Coal Fired Boilers	633,343.50	3,953,692.29	83.57
FF_6M03	Chemical Waste Destructor	633,336.15	3,953,628.65	81.50
FF_4P05	Hot Oil System	633,692.56	3,954,022.81	83.40
FF_5N092	Thermal Oxidizer/Caustic Scrubber	633,629.84	3,953,907.38	83.86
EN_SN01	Entergy Unit 1 Boiler	644,086.7	3,949,432.5	71.52
EN_SN02	Entergy Unit 2 Boiler	644,089.8	3,949,441.4	71.53
EN_SN05	Entergy Auxiliary Boiler	644,064.1	3,949,338.7	71.46
EN_SN20	Entergy Emergency Diesel Generator	643,993.0	3,949,472.0	71.58
EN_SN21	Entergy Emergency Diesel Fire Pump	644,011.0	3,949,296.0	71.43

All modeled sources are point sources and Table 3-2 presents the stack parameters that will be input to the model for each of the sources. Sources EN\_SN20 and EN\_SN21 discharge horizontally and as such will be modeled with a minimal exit velocity (0.001 m/s).



**Table 3-2. Modeled Source Parameters**

Model ID	Stack Height (m)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
FF_5N091	18.29	390.31	9.63	2.44
FF_6M01	60.96	485.26	14.42	2.74
FF_6M03	26.57	357.93	12.18	1.22
FF_4P05	5.20	477.60	2.70	0.46
FF_5N092	7.62	345.15	9.27	0.24
EN_SN01	304.8	433.71	27.43	7.83
EN_SN02	304.8	433.71	27.43	7.83
EN_SN05	4.57	519.26	19.81	0.91
EN_SN20	4.27	790.54	0.001	0.25
EN_SN21	4.27	644.26	0.001	0.13

### 3.3. MODELED EMISSION RATES

As described in the Modeling TAD, attainment modeling demonstrations are intended to represent actual facility emissions. Four of the five FutureFuel units will use actual monthly average emissions data for the 2012-2014 period. For the lowest emitting unit (Thermal Oxidizer, Model ID 5N09\_02), the maximum hourly allowable permit limit (3.0 lb/hr SO<sub>2</sub>) was modeled as a worst-case. Three of the Entergy units (Model ID EN\_SN01, EN\_SN02, and EN\_SN05) will use actual hourly emissions data for the 2012-2014 model. The emergency fire pump (Model ID EN\_SN20) and emergency generator (Model ID EN\_SN21) at Entergy will use variable emission rates based on actual engine testing times as described in Entergy's August 2015 report. The EMISFACT option in AERMOD will be utilized to supply the varying monthly emission rates for the units with monthly emission rate data and to supply Entergy's emergency units with the variable emission rates for weekly testing times. Table 3-3 shows the annual average hourly emission rate for the FutureFuel sources for comparative purposes.



**Table 3-3. Average Hourly Modeled SO<sub>2</sub> Emission Rates**

Model ID	2012 Average Emission Rate (lb/hr)	2013 Average Emission Rate (lb/hr)	2014 Average Emission Rate (lb/hr)
FF_5N091	0.09	0.09	0.05
FF_6M01	561.53	604.68	697.43
FF_6M03	2.53	4.41	3.49
FF_4P05	0.00005	0.00006	0.00006
FF_5N092	3.00	3.00	3.00

Note: The Entergy emission rates are described in their August 2015 report.

### **3.4. BACKGROUND CONCENTRATIONS**

NAAQS modeling demonstrations typically include impacts from the applicant's facility and a background concentration from a representative ambient monitor. When including background concentrations, the potential for double-counting exists, where impacts from explicitly modeled sources may also be included in the concentration measured by the ambient monitor. In their "Clarification Memorandum for 1-hour NO<sub>2</sub> Modeling" (*herein referred to as 1-hour NO<sub>2</sub> Guidance*), EPA provides a general "rule-of-thumb" for estimating the area over which regional inventory sources should be included. That section of the guidance goes on to suggest that for most applications, the inclusion of nearby sources within about 10 km would be sufficient. This guidance is based on the concept of "significant concentration gradient" in which modeled impacts from a given facility are reviewed to determine how quickly concentrations diminish out from the site. Although Entergy is over 11 km from FutureFuel, the SO<sub>2</sub> emissions from Entergy will be included in the model.

Ambient background data from the closest SO<sub>2</sub> monitor, located in Little Rock (Monitor ID# 05-119-0007), will be used to represent other sources of SO<sub>2</sub> in the background. The only other SO<sub>2</sub> monitor in Arkansas is located in El Dorado in the southern portion of the state. EPA Guidance allows the inclusion of background values that vary by season and hour of day that could simulate a lower value than the 99<sup>th</sup> percentile design value from the monitor. The modeling will be performed with a set of seasonal diurnal values developed using methodology described in the *1-hour NO<sub>2</sub> Guidance* which addresses NO<sub>2</sub> modeling and the process for developing seasonal diurnal background values for SO<sub>2</sub>. Table 3-4 shows the seasonal diurnal values that will be used in the model.

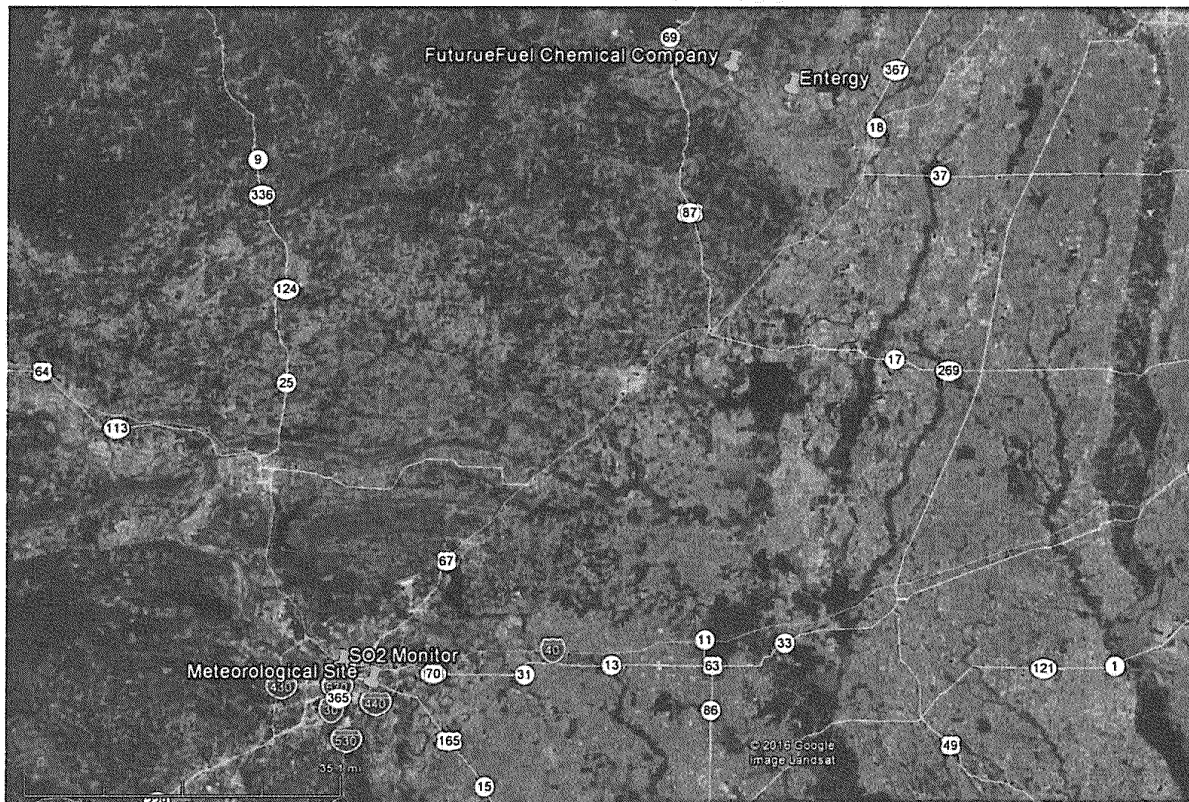


**Table 3-4. Seasonal Diurnal SO<sub>2</sub> Concentrations at Little Rock Monitor**

Hour	Winter (µg/m <sup>3</sup> )	Spring (µg/m <sup>3</sup> )	Summer (µg/m <sup>3</sup> )	Fall (µg/m <sup>3</sup> )
1	6.89	5.67	4.80	5.50
2	7.85	5.32	4.28	6.19
3	7.33	6.19	4.45	6.02
4	6.89	5.76	4.19	4.71
5	8.55	4.97	4.19	5.15
6	9.60	4.80	5.41	5.85
7	9.60	6.28	5.50	6.63
8	8.99	5.24	6.11	6.54
9	7.50	6.46	7.68	7.85
10	8.38	8.20	7.42	9.07
11	9.16	8.46	9.95	8.20
12	10.73	15.09	10.38	9.34
13	9.69	11.08	10.91	11.17
14	10.56	9.34	9.86	9.51
15	10.03	8.20	13.18	9.95
16	9.42	7.94	9.34	10.47
17	7.15	9.86	11.08	9.16
18	7.50	7.42	9.69	7.24
19	9.25	6.37	9.86	6.98
20	12.30	6.54	8.73	5.93
21	9.07	6.02	6.19	6.28
22	6.11	8.99	5.76	5.67
23	6.46	7.07	5.67	5.85
24	7.24	6.81	5.41	6.11



Figure 3-1 shows the relative locations of the FutureFuel facility, Entergy, the meteorological site and the SO<sub>2</sub> monitor.



**Figure 3-1. Relative Locations of FutureFuel Facility, Entergy, Meteorological Site, and SO<sub>2</sub> Monitor**

### 3.5. METEOROLOGICAL DATA

AERMOD-ready meteorological data for the period 2012-2014 was prepared using the latest version of the EPA's AERMET meteorological processing utility (version 15181) and will be used for this analysis. Standard EPA meteorological data processing guidance was used as outlined in a recent memorandum<sup>7</sup> and other documentation.

#### 3.5.1. Surface Data

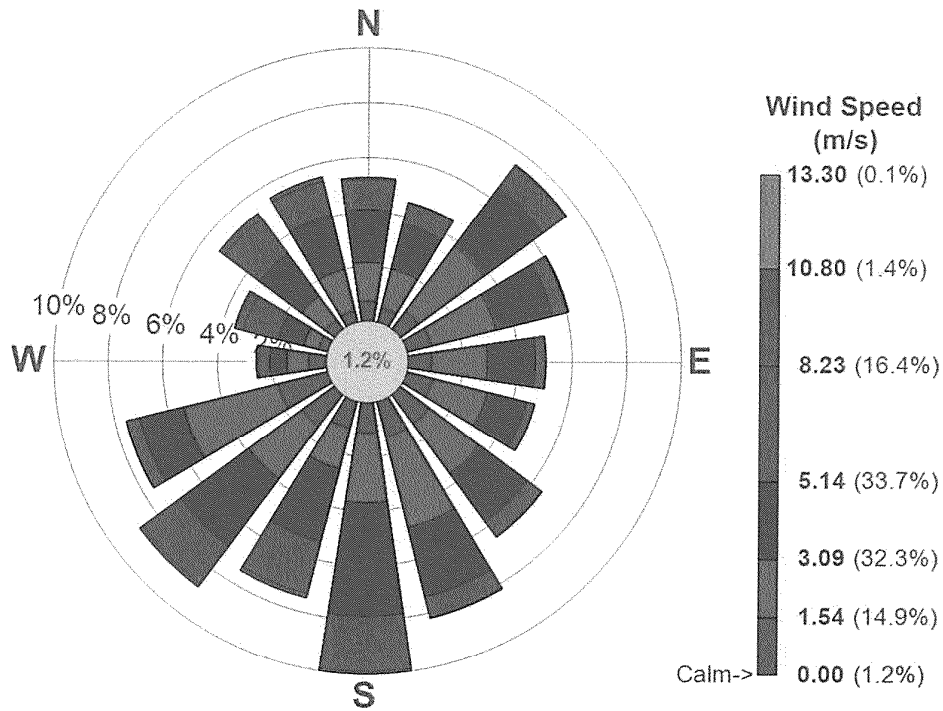
Raw hourly surface meteorological data was obtained from the U.S. National Climatic Data Center (NCDC) for Little Rock Clinton National Airport/Adams Field (KLIT, WMO ID: 722310) in the standard ISHD format. This data was supplemented with TD-6405 (commonly referred to as "1-minute ASOS") wind data from KLIT. The 1-

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<sup>7</sup> Fox, Tyler, U.S. Environmental Protection Agency. 2013. "Use of ASOS Meteorological Data in AERMOD Dispersion Modeling." Available Online: [http://www.epa.gov/ttn/scram/guidance/clarification/20130308\\_Met\\_Data\\_Clarification.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/20130308_Met_Data_Clarification.pdf)



minute wind data was processed using the latest version of the EPA AERMINUTE pre-processing tool (version 15272). Quality of the 1-minute data was verified by comparison to the hourly ISHD data from KLIT, which showed only small differences typical of 1-minute and hourly wind data comparisons. The “Ice-Free Winds Group (IFWG)” option was utilized in AERMINUTE due to the fact that a sonic anemometer was installed at KLIT on May 21, 2009.<sup>8</sup> As such, the IFWG option was engaged for the full 2012-2014 period. Figure 3-2 shows the distribution of wind speed and direction for the site.



**Figure 3-2. 2012-2014 Wind Rose for Little Rock Airport (KLIT)**

### 3.5.2. Upper Air Data

In addition to surface meteorological data, AERMET requires the use of data from a sunrise-time upper air sounding to estimate daytime mixing heights. The nearest U.S. National Weather Service (NWS) upper-air radiosonde station is located in Little Rock, AR (LZK). Upper air data for the same 2012-2014 time period were obtained from the National Oceanic and Atmospheric Administration (NOAA) in FSL format.<sup>9</sup>

<sup>8</sup> [http://www.nws.noaa.gov/ops2/Surface/documents/IFW\\_stat.pdf](http://www.nws.noaa.gov/ops2/Surface/documents/IFW_stat.pdf)

<sup>9</sup> <http://esrl.noaa.gov/raobs/>



### 3.5.3. Land Use Analysis

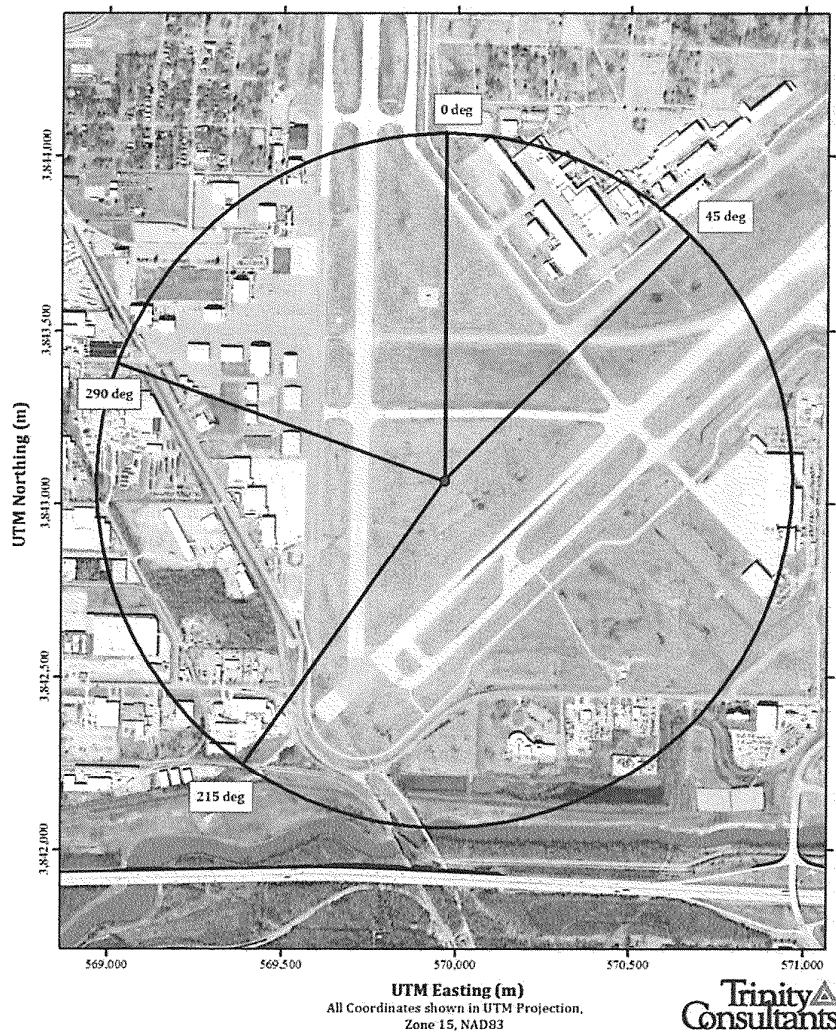
Parameters derived from the analysis of land use data (surface roughness, Bowen ratio, and albedo) are also required by AERMET. In accordance with EPA guidance, these values will be determined using the latest version of the EPA AERSURFACE tool (version 13016).<sup>10</sup> The AERSURFACE settings that will be used for processing are summarized in Table 3-5. The met station coordinates were determined by visually identifying the met station in Google Earth. NLCD 1992 (CONUS) Land Cover data that will be used in AERSURFACE processing was obtained from the Multi-Resolution Land Use Consortium (MRLC).

EPA recommendations were used to specify the area used for the AERSURFACE analysis. Surface roughness was estimated based on land use within a 1 km radius of the meteorological station, with directional variation in roughness accounted for by dividing that circle into sectors with common landuse types. By default, AERSURFACE assumes twelve 30-degree landuse sectors. In cases where the landuse is uniform, that is an acceptable approach. However, in the case of the LIT airport, there are four (4) directional sectors with truly distinct landuse categories. Figure 3-3 shows the wind direction sectors input to AERSURFACE for the surface roughness portion of the landuse analysis.

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<sup>10</sup> U.S. Environmental Protection Agency. 2013. "AERSURFACE User's Guide." EPA-454/B-08-001, Revised 01/16/2013. Available Online: [http://www.epa.gov/scram001/7thconf/aermod/aersurface\\_userguide.pdf](http://www.epa.gov/scram001/7thconf/aermod/aersurface_userguide.pdf)





**Figure 3-3. AERSURFACE Land Use Sector Analysis**

Albedo and Bowen ratio are regional parameters and were estimated within AERSURFACE, based on the default 10x10 km box centered on the meteorological station.

EPA guidance dictates that on at least an annual basis, precipitation at a surface site should be classified as wet, dry, or average in comparison to the 30-year climatological record at the site. This determination is used to adjust the Bowen ratio estimated by AERSURFACE. To make the determination, annual precipitation in each



modeled year (2012-2014) was compared to the 1981-2010 climatological record for KLIT.<sup>11</sup> The 30<sup>th</sup> and 70<sup>th</sup> percentile values of the annual precipitation distribution from 1981-2010 were calculated. Per EPA guidance, each modeled year was classified for AERSURFACE processing as “wet” if its annual precipitation was higher than the 70<sup>th</sup> percentile value, “dry” if its annual precipitation was lower than the 30<sup>th</sup> percentile value, and “average” if it was between the 30<sup>th</sup> and 70<sup>th</sup> percentile values. The values that will be used in this case are included in Table 3-5.

The site location does not experience meteorological seasons like the default seasonal categories in AERSURFACE, therefore the monthly categories were modified to better represent the meteorological seasons the site experiences. The modified seasons are shown in Table 3-6.

**Table 3-5. AERSURFACE Input Parameters**

AERSURFACE Parameter	Value
Met Station Latitude	34.727266
Met Station Longitude	-92.235811
Datum	NAD 1983
Radius for surface roughness (km)	1.0
Vary by Sector?	Yes
Number of Sectors	4 (0-45, 45-215, 215-290, 290-360)
Temporal Resolution	Seasonal
Continuous Winter Snow Cover?	No
Station Located at Airport?	Yes
Arid Region?	No
Surface Moisture Classification	Dry (2012), Wet (2013), Average (2014)

**Table 3-6 Modified AERSURFACE Seasons**

Seasonal Category	Season Description	Month Assignments
1	Midsummer with lush vegetation	May, Jun, Jul, Aug, Sept
2	Autumn with unharvested cropland	Oct, Nov
3	Late autumn after frost and harvest, or winter with no snow	Dec, Jan, Feb
5	Transitional spring with partial green coverage or short annuals	Mar, Apr

<sup>11</sup> National Climatic Data Center. 2010 Local Climatological Data (LCD), (KMSY).



### 3.5.4. AERMET Processing Options

EPA released AERMET Version 12345 which included a beta option, ADJ\_U\*, to better account for turbulence in the atmosphere during low wind speed stable conditions. Subsequent releases of AERMET have incorporated modifications to the ADJ\_U\* formulation to better address micrometeorological refinements (e.g. Bulk Richardson Number, low solar elevation angles). The ADJ\_U\* option adjusts the surface friction velocity parameter (U\*) used by AERMET in certain low wind speed situations. This option, based on a peer-reviewed study<sup>12</sup>, was added to AERMET by EPA to address the tendency of AERMET/AERMOD to underestimate dispersion and thus overestimate ground-level pollutant concentrations for low-level sources under low wind speed conditions, especially for shorter-term averaging periods. Given the refined nature of this beta option and the peer reviewed studies which have acknowledged its accuracy, including EPA, FutureFuel has incorporated this AERMET option. A detailed justification for the use of ADJ\_U\* is contained in Appendix A.

The AERMET data processing procedure utilized regulatory default options in this case<sup>13,14</sup> with the exception of the ADJ\_U\* option. The options selected include:

- MODIFY keyword for upper air data
- THRESH\_1MIN 0.5 keyword to provide a lower bound of 0.5 m/s for 1-minute wind data
- AUDIT keywords to provide additional QA/QC and diagnostic information
- ASOS1MIN keyword to incorporate 1-minute wind data
- NWS\_HGT WIND 10 keyword to designate the anemometer height as 10 meters
- METHOD WIND\_DIR RANDOM keyword to correct for any wind direction rounding in the raw ISHD data
- METHOD REFLEVEL SUBNWS keyword to allow use of airport surface station data
- Default substitution options for cloud cover and temperature data were not overridden
- Default ASOS\_ADJ option for correction of truncated wind speeds was not overridden
- ADJ\_U\* beta option was used

### 3.6. MODELED RECEPTORS

A comprehensive Cartesian receptor grid extending out to approximately 20 kilometers from FutureFuel and Entergy will be used in the AERMOD modeling analysis to assess maximum ground level 1-hour SO<sub>2</sub> concentrations. The Modeling TAD states that the receptor grid must be sufficient to determine ambient air quality in the vicinity of the source being studied. Preliminary modeling analyses were conducted to determine appropriate extents for the modeled receptor grids, which will consist of the following:

- 50-meter spacing along both the facilities fencelines (fenceline grids);
- 100-meter spacing extending from the Entergy fenceline to 5 kilometers (Entergy fine grid);
- 100-meter spacing extending from the FutureFuel fenceline to 7 kilometers (FutureFuel fine grid);
- 200-meter spacing extending from 7 to 10 kilometers around FutureFuel (FutureFuel medium grid); and
- 500-meter spacing extending from 10 to 20 kilometers around FutureFuel (FutureFuel coarse grid); and

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<sup>12</sup> Qian and Venkatram. 2011. "Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions." *Boundary-Layer Meteorology*, Volume 138, Issue 3, pp 475-491.

<sup>13</sup> Fox, Tyler, U.S. Environmental Protection Agency. 2013. "Use of ASOS Meteorological Data in AERMOD Dispersion Modeling." Available Online: [http://www.epa.gov/ttn/scram/guidance/clarification/20130308\\_Met\\_Data\\_Clarification.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/20130308_Met_Data_Clarification.pdf)

<sup>14</sup> U.S. Environmental Protection Agency. 2014. "User's Guide for the AERMOD Meteorological Preprocessor (AERMET)". EPA-454/B-03-002, November 2004).



- 1,000-meter spacing extending out 20 kilometers around both facilities (Overall coarse grid).

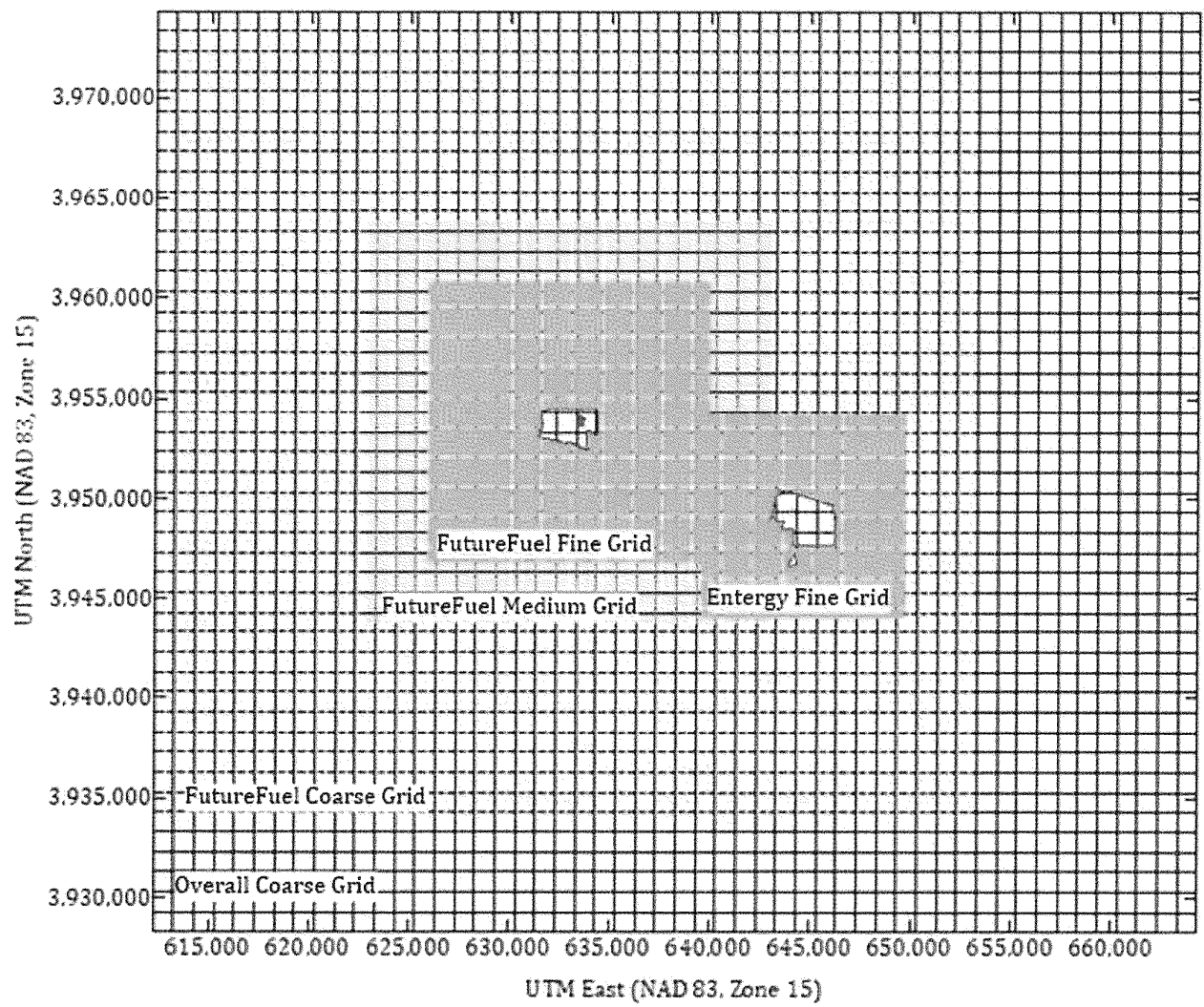
The above receptor data will be used without modification in the modeling. Per the Modeling TAD, a number of receptors located over the White River could be excluded from the modeling domain because ambient monitors could not reasonably be placed at these locations, but these receptors will be retained in this analysis as a measure of conservatism.

The AERMOD model is capable of handling both simple and complex terrain. Through the use of the AERMOD terrain preprocessor (AERMAP), AERMOD incorporates not only the receptor heights, but also an effective height (hill height scale) that represents the significant terrain features surrounding a given receptor that could lead to plume recirculation and other terrain interaction.<sup>15</sup> Receptor terrain elevations input to the model will be interpolated from National Elevation Database (NED) data obtained from the USGS. NED data consist of arrays of regularly spaced elevations. The array elevations will be at a resolution of 1 arc second (approximately 30 m intervals) and will be interpolated using the latest version of AERMAP (version 11103) to determine elevations at the defined receptor intervals. The receptor grids that will be modeled are shown in Figure 3-4.

---

<sup>15</sup> US EPA *Users Guide for the AERMOD Terrain Preprocessor (AERMAP)*, EPA-454/B-03-003, Research Triangle Park, NC.





**Figure 3-4. Receptor Grids**



### 3.7. BUILDING DOWNWASH

AERMOD incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithms. Direction specific building parameters required by AERMOD are calculated using the BPIP-PRIME preprocessor (version 04274). Downwash effects will be considered through the use of this program.

EPA has promulgated stack height regulations that restrict the use of stack heights in excess of “Good Engineering Practice” (GEP) in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP height is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. However, since the DRR modeling process is determining attainment for the area around a facility, the TAD document appropriately recommends that actual stack heights be used.



## APPENDIX A: USE OF ADJ\_U\* IN FUTUREFUEL SO<sub>2</sub> DISPERSION MODELING

---

When AERMOD is run with a meteorological dataset derived from one-minute meteorological data as is currently recommended by U.S. EPA, low wind speeds are much more prevalent than in prior versions of the modeling system that did not rely on one-minute meteorological data. These low wind speeds have been linked to potential overestimates in ambient concentrations by AERMOD.<sup>16</sup> These overestimates occur, in part, due to an underestimate of friction velocity ( $u^*$ ) by the AERMET meteorological processor. U.S. EPA recognized this underestimation as a potential issue with AERMET and released AERMET Version 12345 which included a beta option, ADJ\_U\*. The ADJ\_U\* beta option allows the friction velocity ( $u^*$ ) to be adjusted using the methods of Qian and Venkatram<sup>17</sup> to better account for turbulence in the atmosphere during low wind speed stable conditions. This beta option was updated to incorporate a modified Bulk Richardson Number methodology in version 13350, was further modified to adjust  $u^*$  for low solar elevation angles with version 14134, and was most recently used to modify the calculation of the turbulence measure, Monin-Obukhov length in Version 15181.<sup>18</sup> Given the refined nature of this beta option and the peer reviewed studies which have acknowledged its accuracy, FutureFuel is proposing to incorporate this option into the modeling analysis to allow more representative and more accurate modeling results.

The U.S. EPA has proposed to make the ADJ\_U\* option a regulatory default in the forthcoming revisions to the *Guideline*.<sup>19</sup> Currently, however, the  $u^*$  option is not a default option in AERMOD, the combined use of AERMOD plus the  $u^*$  adjustment in the meteorology file (generated by AERMET) would no longer have “preferred” status in the sense that it is a model to be used for regulatory purposes without additional regulatory authority approval. To substantiate that the adjusted friction velocity option in AERMOD is a valid model to use in this situation, Section 3.2 of Appendix W describes steps to be considered to allow the use of the  $u^*$  adjusted AERMOD as an acceptable alternative model. The section also describes criteria for determining the acceptability of an alternative model. Section 3.2.2.b states that satisfying any one of the three alternative conditions may make use of an alternative model acceptable. Condition 1 states that the alternative model will demonstrate equivalency. But in this case the AERMOD Model is the preferred model of choice with just an option change (making it alternative). Because the model cannot have a demonstration of equivalency to itself and the option change will result in different results, this condition is not applicable. This leaves the satisfaction of Conditions 2 and 3 as criteria to accept the  $u^*$  option in AERMOD. Condition 2 requires the formal submittal of a protocol to allow demonstration of superior performance which is acceptable to the control agency and to FutureFuel. This type of study would require appropriate ambient air quality monitoring and side-by-side modeling and comparisons which are well beyond the scope of this modeling demonstration.

Thus, Condition 3 was reviewed and followed along with the individual criteria to meet its requirements. Section 3.2.2.e states that an alternative refined model may be used provided that five criteria are met. These are:

---

<sup>16</sup> Wenjun Qian and Akula Venkatram, “Performance of Steady State Dispersion Models Under Low Wind-Speed Conditions,” *Boundary-Layer Meteorology*, no. 138 (2011): 475-491.

<sup>17</sup> Ibid.

<sup>18</sup> [http://www.epa.gov/ttn/scram/7thconf/aermod/aermet\\_mcb3.txt](http://www.epa.gov/ttn/scram/7thconf/aermod/aermet_mcb3.txt);  
[http://www.epa.gov/ttn/scram/7thconf/aermod/aermet\\_mcb4.txt](http://www.epa.gov/ttn/scram/7thconf/aermod/aermet_mcb4.txt);  
[http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET\\_mcb5.pdf](http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET_mcb5.pdf);  
[http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET\\_mcb6.pdf](http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET_mcb6.pdf)

<sup>19</sup> [https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR\\_AppendixW\\_Proposal.pdf](https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR_AppendixW_Proposal.pdf)



- i. The model has received a scientific peer review;
- ii. The model can be demonstrated to be applicable to the problem on a theoretical basis;
- iii. The data bases which are necessary to perform the analysis are available and adequate;
- iv. Appropriate performance evaluations of the model have shown that the model is not biased towards underestimates; and
- v. A protocol on methods and procedures to be followed has been established.

Review of these criteria as well as the responses to each within the context of modeling for FutureFuel have shown the use of the  $u^*$  option, as generated by AERMET in the meteorological file and used in AERMOD, to be valid and representative for the modeling domain in the vicinity of the facility. The response to each criteria is given in the following Appendix A subsections.

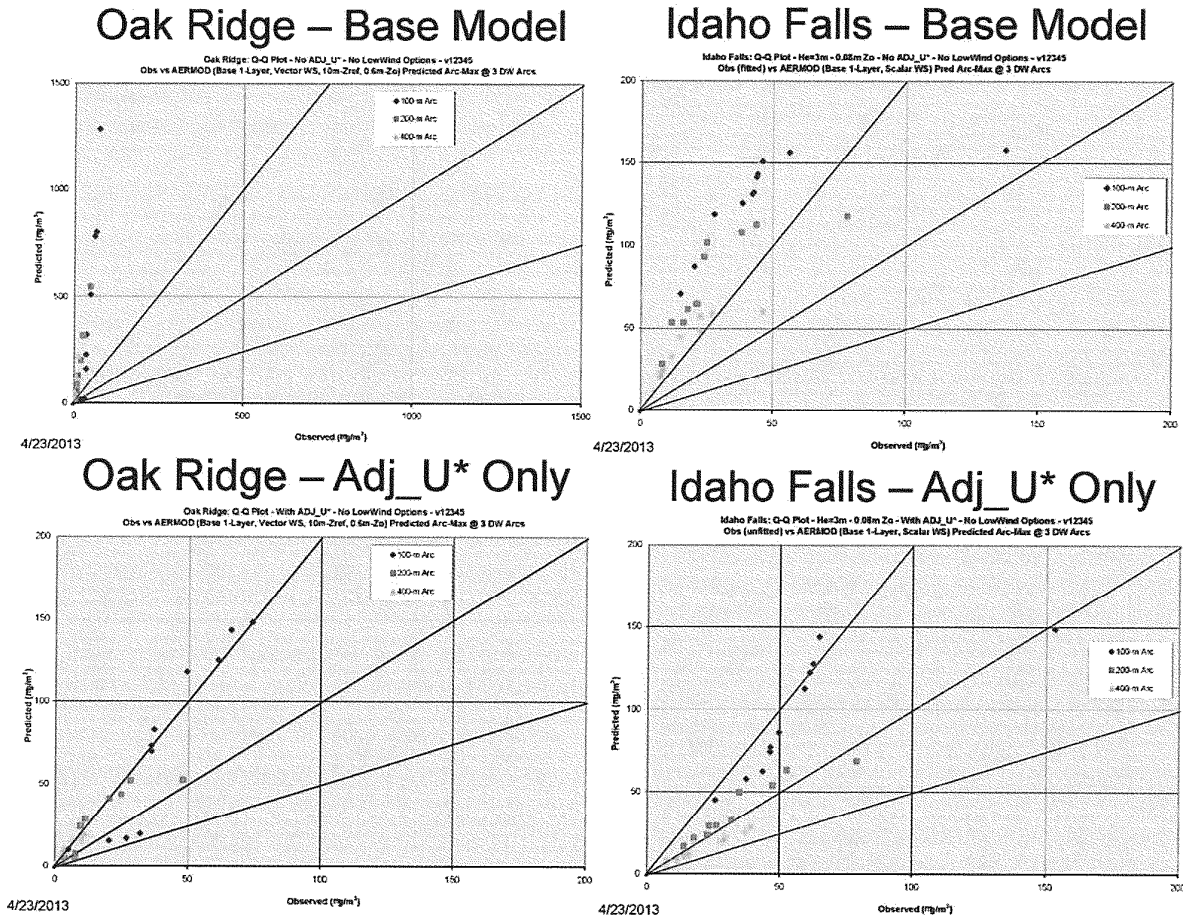
### CRITERIA 3.2.2.e.i - SCIENTIFIC PEER REVIEW

The use of an adjusted friction velocity in AERMOD has received scientific peer review and been evaluated both by U.S. EPA modelers as well as others in the scientific and modeling community. Three examples are:

- The paper entitled “Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions” by Wenjun Qian and Akula Venkatram, *Boundary Layer Meteorology*, Volume 138, pp 475-491, 2011. This paper examined the AERMOD Model to estimate dispersion under low wind speed events. Two tracer studies, the Prairie Grass Experiment and the Idaho Falls experiment, were compared to the use of AERMOD with and without  $u^*$  adjustments. The analysis reports that the tendency of AERMOD to overestimate ambient air impacts during low wind speed events was reduced by incorporating an empirical modification. This modification is incorporated into the AERMET program through the ADJ\_U\* keyword. This option generates the enhanced friction velocity datasets on a low wind speed, stable atmosphere, hour-by-hour basis. Also in his email memorandum dated June 26, 2013, George Bridgers of the U.S. EPA’s Office of Air Quality Planning and Standards, notes that “The AERMET BETA option is based on a peer reviewed study (Qian and Venkatram, 2011) which also includes independent evaluations of the new  $u$ -star estimates...”.
- In his April 23, 2013 presentation at the Regional/State/Local Modeling Meeting in Dallas, Texas, Roger Brode showed “improved AERMOD performance” when including the  $u^*$  adjustment. The figures below from Mr. Brode’s presentation demonstrate the enhanced performance of AERMOD for two field data bases, namely the Oak Ridge Study and the Idaho Falls Study. The closer the points are to the center line of each graph, the better the model performance.



Figure A-1. Comparison of the AERMOD Model with and without the  $u^*$  Adjustment



- The paper entitled “Evaluation of low wind modeling approaches for two tall-stack databases” by Robert Paine, Olga Samani, Mary Kaplan, Eladio Knipping and Naresh Kumar, Journal of the Air & Waste Management Association, 65:11, 1341-1353. This paper evaluates model performance for the LOWWIND options in AERMET and AERMOD for two databases: Mercer County, North Dakota and Gibson Power Station in Indiana. Since the Indiana database is in an area with flat terrain, it is not applicable to this modeling analysis. However, the North Dakota databases consists of tall stacks in rolling terrain, including monitor locations at elevations above stack base elevation, which is similar to the terrain surrounding the FutureFuel Chemical site. As shown in Table 4 of the paper, the predicted/observed impact ratios were improved from 2.20 to 1.53 for the monitor location (DGC #17) in the elevated terrain surrounding the sources.

### CRITERIA 3.2.2.e.ii - APPLICABLE ON A THEORETICAL BASIS

Over the past several years many scientific studies have noted that Gaussian dispersion models tend to over predict concentrations at low wind speeds. In the early days of dispersion modeling when the threshold velocities of the National Weather Service anemometers were a few miles per hour, the common use of 1 m/s as



the lowest wind speed that would be considered in the model was prevalent. The modeling community recognized that winds lower than that would result in ambient concentration estimates that were not coincidental with ambient monitored values at these same low wind speed conditions. Because concentration is inversely proportional to wind speed, impacts increase greatly as wind speeds fall below 1 m/s. In addition, other studies and field research showed that winds tend to meander during low wind speeds, meaning that the wind was not in only one direction during the time step of the Gaussian models, namely one hour, but tended to change over the time step. The relationship between this phenomenon and the friction velocity calculations in AERMET determined that adjusting the  $u^*$  could have the same effect as adjusting plume meander and was better estimated empirically (as demonstrated in the peer reviewed paper by Qian and Venkatram).

In reviewing the frequency distribution of winds from the Little Rock, AR Airport for the period of record of this modeling analysis, the number of hours in the range of 0.28 m/s (the lower limit where AERMOD will make a calculation) and 3.1 m/s wind speed is 12,414 hours over the three year period of record or 47.2%. In fact, the observed wind speeds are less than 2 m/s for 6,327 hours (24.1%) over the 2012-2014 modeling period. The overall distribution is shown in Table A-1. As previously discussed, the incorporation of the 1 minute ASOS wind observations has greatly reduced the number of calm (and thus unmodeled) hours and replaced them in many cases with low wind speed hours. Thus, the consideration of better science in terms of the  $u^*$  adjustment is applicable and reasonable given this relatively high frequency of low wind occurrences.

**Table A-1. Distribution of Hourly Observations by Wind Speed and Wind Direction**

Dir \ Spd	<= 1.54	<= 3.09	<= 5.14	<= 8.23	<= 10.80	> 10.80	Total
0.0	0.74	1.41	1.95	1.11	0.07	0.00	5.28
22.5	0.55	1.49	1.69	0.79	0.02	0.00	4.54
45.0	0.84	2.98	2.65	1.03	0.03	0.00	7.53
67.5	0.94	2.43	2.13	0.55	0.02	0.03	6.10
90.0	0.87	2.03	1.76	0.37	0.02	0.00	5.05
112.5	1.00	2.06	1.46	0.29	0.01	0.00	4.83
135.0	1.35	2.29	2.19	0.66	0.03	0.00	6.51
157.5	1.35	3.45	2.60	0.76	0.04	0.00	8.21
180.0	1.13	2.57	4.16	2.05	0.09	0.00	9.99
202.5	1.03	1.54	2.76	1.97	0.15	0.00	7.45
225.0	1.46	2.41	3.08	1.73	0.13	0.01	8.82
247.5	1.85	3.57	1.65	0.47	0.03	0.00	7.58
270.0	0.63	0.81	0.62	0.40	0.07	0.03	2.56
292.5	0.34	0.56	0.97	1.32	0.29	0.05	3.53
315.0	0.42	1.08	1.94	1.60	0.23	0.01	5.28
337.5	0.44	1.56	2.05	1.28	0.16	0.01	5.50
Total	14.93	32.26	33.66	16.39	1.38	0.14	98.77
Calms							1.20
Missing							0.03
Total							100.00

As previously shown, the default AERMOD model is susceptible to overprediction for taller stacks located in elevated terrain. Figure A-2 presents the area surrounding the FutureFuel Chemical site with terrain contours overlaid to indicate the rolling nature of terrain and thus the potential for model overprediction in the areas to the north and southwest of the facility. Given the combination of steep terrain and low wind speed, the ADJ\_U\* option is very applicable to this analysis on a theoretical basis.



Figure A-2. Terrain Surrounding the FutureFuel Chemical Site





### CRITERIA 3.2.2.e.iii - AVAILABILITY OF DATABASES

The test data bases and reporting for low wind speed observations and evaluation are available to assess model performance. The data bases applicable to this discussion and use of the  $u^*$  option in AERMET and AERMOD are:

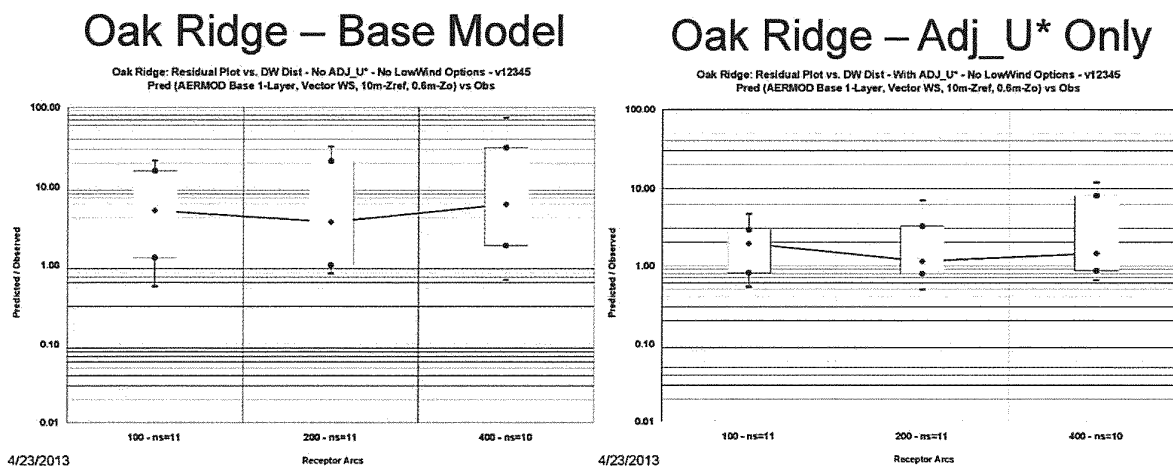
- Idaho Falls Study- Sagendorf JF, Dickson CR (1974) Diffusion under low wind speed, inversion conditions. NOAA Technical Memorandum ERL ARL-52, 89 pp.
- Prairie Grass Study - Barad ML (ed) (1958) Project Prairie Grass. A field program in diffusion. Geophysical research paper no. 59, vols I (300 pp) and II (221 pp). AFCRF-TR-58-235. Air Force Cambridge Research Center, Bedford, Massachusetts; under Model Evaluation Databases on U.S EPA's website - [http://www.epa.gov/ttn/scram/dispersion\\_prefrec.htm](http://www.epa.gov/ttn/scram/dispersion_prefrec.htm)
- Oak Ridge Study - NOAA Technical Memorandum ERL ARL-61, 1976. Diffusion under Low Wind Speed Conditions near Oak Ridge, Tennessee. Wilson, R. B., G. Start, C. Dickson, N. Ricks. Air Resources Laboratory, Idaho Falls, Idaho.

In addition, the AERMET source code and all input data required for implementing the  $ADJ\_U^*$  are publicly available on U.S. EPA's SCRAM website.

### CRITERIA 3.2.2.e.iv - DEMONSTRATION OF NO BIASES TOWARDS UNDERESTIMATES

As demonstrated in a number of studies over the past 3-5 years, including the 2010 study by AECOM<sup>20</sup>, the use of the  $u^*$  adjustment in dispersion modeling has not shown any bias towards underestimating the ambient concentrations due to sources and emissions. A repeat use of the same Oak Ridge data set in 2013 by the U.S. EPA in their model performance evaluation demonstrates both the improved performance of AERMOD with  $u^*$  option and no bias towards underestimation as shown in Figure A-3.

**Figure A-3. Residual Plots Showing Improved Performance with  $u^*$  and No Bias toward Underestimation**



<sup>20</sup> AERMOD Low Wind Speed Evaluation Study Results, AECOM prepared for the American Petroleum Institute, Washington, DC, March 22, 2010.



**To:** Clark, David[CLARKD@adeq.state.ar.us]; Donaldson, Guy[Donaldson.Guy@epa.gov]  
**Cc:** McCorkle, Mark[MAC@adeq.state.ar.us]; Snyder, Erik[snyder.erik@epa.gov]  
**From:** Mohr, Ashley  
**Sent:** Thur 6/16/2016 2:22:19 PM  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

David/Mark –

Guy is also out of the office this week, so I am providing a response.

We have provided the request documentation to HQs and have requested a time to discuss. As we mentioned before, HQs is in the final push for finishing up the Appendix W rulemaking so there availability has been limited. I will let you all know when we have been able to schedule a time with the appropriate folks at HQs. Meanwhile, we have been reviewing the information here in the Region and will let you know if we identify any additional information needs or have any questions.

Feel free to contact me directly to follow-up.

Thanks,

Ashley

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OFFICIAL EPA POLICY.

**From:** Clark, David [mailto:CLARKD@adeq.state.ar.us]  
**Sent:** Tuesday, June 14, 2016 8:44 AM  
**To:** Donaldson, Guy <Donaldson.Guy@epa.gov>



**Cc:** McCorkle, Mark <MAC@adeq.state.ar.us>; Mohr, Ashley <Mohr.Ashley@epa.gov>; Snyder, Erik <snyder.erik@epa.gov>  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS  
Independence County Designation

Hello Guy,

Has this request gone to HQ or do you have any other updates?

I will be out of the office for a week starting tomorrow, June 15 through Wednesday June 22, so during my absence please Cc Mark McCorkle on any new information you may have for us.

Thank you in advance,

David

**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR. 72118

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**From:** Donaldson, Guy [<mailto:Donaldson.Guy@epa.gov>]



**Sent:** Tuesday, May 24, 2016 5:05 PM

**To:** Clark, David

**Cc:** McCorkle, Mark; Mohr, Ashley; Snyder, Erik

**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

David, I have checked in with our folks. Your request is being reviewed by Regional Staff. We expect that we will complete the Regional Review in the next 6-10 days and send to HQs. It is difficult to predict how long HQs review will take because there seems to be a large number of request going through the system. We will contact you when we have a better idea after we send it up.

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]

**Sent:** Tuesday, May 24, 2016 11:59 AM

**To:** Donaldson, Guy

**Cc:** McCorkle, Mark; Mohr, Ashley; Snyder, Erik

**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Thank you Guy.

**David W. Clark, M.S.**

Epidemiologist

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**From:** Donaldson, Guy [<mailto:Donaldson.Guy@epa.gov>]  
**Sent:** Tuesday, May 24, 2016 11:16 AM  
**To:** Clark, David  
**Cc:** McCorkle, Mark; Mohr, Ashley; Snyder, Erik  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

I am checking on the status.

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]  
**Sent:** Tuesday, May 24, 2016 8:40 AM  
**To:** Donaldson, Guy  
**Cc:** McCorkle, Mark  
**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Good morning Guy,

I'm contacting to inquire about the status of the AERMOD protocol/Clearinghouse request we submitted as part of our SO2 designations work for Independence County. Do you know or could you please see where this stands?

Thank you in advance for any information,

David



**David W. Clark, M.S.**

Epidemiologist

Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality

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North Little Rock, AR. 72118

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**From:** Clark, David

**Sent:** Friday, April 29, 2016 8:55 AM

**To:** 'Donaldson, Guy'; Snyder, Erik

**Cc:** McCorkle, Mark; Spencer, Stuart

**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Hello Guy & Erik,

Attached find a SO2 NAAQS designation AERMOD protocol/Clearinghouse request for Independence County, Arkansas that ADEQ is submitting in response to Ron Curry's February 11, 2016 letter to Arkansas' Governor Hutchinson (also attached) regarding the insufficient information for an Unclassifiable/Attainment SO2 NAAQS designation for Independence County. We have also sent this protocol/Clearinghouse request to both of you as a hardcopy document via postal mail.

David



**David W. Clark, M.S.**

Epidemiologist

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**From:** Donaldson, Guy [<mailto:Donaldson.Guy@epa.gov>]

**Sent:** Thursday, April 21, 2016 1:06 PM

**To:** Clark, David; Snyder, Erik

**Cc:** McCorkle, Mark

**Subject:** RE: EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation

Thx for the heads up.

**From:** Clark, David [<mailto:CLARKD@adeq.state.ar.us>]

**Sent:** Thursday, April 21, 2016 9:26 AM

**To:** Donaldson, Guy; Snyder, Erik

**Cc:** McCorkle, Mark

**Subject:** EPA R6 & Model Clearinghouse Submittal - Arkansas SO2 NAAQS Independence County Designation



Good morning Guy & Erik,

I'm sending this correspondence as follow-up to Ron Curry's February 11, 2016 letter to Arkansas' Governor Hutchinson regarding the insufficient information for an Unclassifiable/Attainment SO2 NAAQS designation for Independence County, Arkansas and the stated opportunity for ADEQ to submit additional information. As you will recall, this letter prompted a February 29, 2016 phone conversation that included EPA R6, the Model Clearinghouse, ADEQ, FutureFuel Chemical Company (FutureFuel) and Entergy Arkansas Independence Steam Electrical Station (Entergy) where a combined FutureFuel/Entergy AERMOD dispersion analysis and a potential Model Clearinghouse submittal was discussed. From FutureFuel, ADEQ has received, reviewed and intends to forward to EPA R6 for consideration a modeling protocol and Clearinghouse request to employ ADJ\_U\* in a combined FutureFuel/Entergy AERMOD dispersion analysis.

This protocol/request is awaiting the signature of ADEQ's Office of Air Quality Associate Director, Stuart Spencer, who is out of the office this week at a conference and will return Monday April 25, 2016. With Stuart's return next week we anticipate forwarding this protocol/request to both of you for consideration and desired concurrence submittal to the Model Clearinghouse. Please accept this message as an update to keep you abreast of our progress with this endeavor and I will follow-up with both of you next week.

Thank you in advance for your assistance,

David

**David W. Clark, M.S.**

Epidemiologist

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5301 Northshore Drive



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**To:** Donaldson, Guy[Donaldson.Guy@epa.gov]  
**Cc:** Snyder, Erik[snyder.erik@epa.gov]; Spencer, Stuart[SPENCER@adeq.state.ar.us];  
Montgomery, William[Montgomery@adeq.state.ar.us]; McCorkle, Mark[MAC@adeq.state.ar.us]  
**From:** Clark, David  
**Sent:** Fri 1/20/2017 3:50:44 PM  
**Subject:** RE: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas

Guy,  
Disregard that Governor's Letter, the Governor's office signed the wrong letter and the correct one will go to you soon.  
David

David W. Clark, M.S.  
Epidemiologist  
Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality  
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-----Original Message-----

From: Clark, David  
Sent: Friday, January 20, 2017 9:40 AM  
To: Guy Donaldson (donaldson.guy@epa.gov)  
Cc: Snyder, Erik (snyder.erik@epa.gov); Spencer, Stuart (SPENCER@adeq.state.ar.us); Montgomery, William; McCorkle, Mark  
Subject: FW: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas  
Importance: High

Guy,  
Attached is the follow-up Arkansas Governor's SO2 Designations letter that Stuart mentions below. I am also putting a copy of this Governor's Letter and DVDs that contain the reports and modeling files in the postal mail to you.

David

David W. Clark, M.S.  
Epidemiologist  
Air Division – Planning & Air Quality Analysis Branch Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR. 72118  
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-----Original Message-----

From: Spencer, Stuart

Sent: Friday, January 13, 2017 2:12 PM

To: 'Donaldson, Guy (Donaldson.Guy@epa.gov)'

Cc: 'Stenger, Wren (stenger.wren@epa.gov)'; Keogh, Becky; Montgomery, William; McCorkle, Mark; 'Coleman.Sam@epa.gov'; 'gray.david@epa.gov'; Clark, David

Subject: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas

Importance: High

Guy,

I am pleased to attach for your review and consideration ADEQ's letter recommending an "unclassifiable/attainment" designation for Benton, Independence, and Mississippi Counties, as well as the accompanying modeling reports for the facilities in each of those counties with SO2 emissions greater than the EPA-determined threshold for review. I am attaching the reports for Plum Point and Flint Creek to this e-mail. I will send the Independence County report (Entergy Independence facility and FutureFuel Chemical Company) separately due to its size. An official Governor's letter will follow.

I appreciate our call on this issue earlier this week. Thank you, again, for your guidance and assistance.

Sincerely,

Stuart Spencer

Associate Director- Office of Air Quality Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR 72118

Ph. # (501) 682-0750

Fax # (501) 682-0880

E-mail: [SPENCER@adeq.state.ar.us](mailto:SPENCER@adeq.state.ar.us)

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**To:** Donaldson, Guy[Donaldson.Guy@epa.gov]; Spencer, Stuart[SPENCER@adeq.state.ar.us]  
**Cc:** Stenger, Wren[stenger.wren@epa.gov]; keogh@adeq.state.ar.us[keogh@adeq.state.ar.us];  
Montgomery, William[Montgomery@adeq.state.ar.us]; McCorkle, Mark[MAC@adeq.state.ar.us];  
Coleman, Sam[Coleman.Sam@epa.gov]; Gray, David[gray.david@epa.gov]  
**From:** Clark, David  
**Sent:** Tue 1/17/2017 2:09:08 PM  
**Subject:** RE: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of  
Arkansas (Independence County Report)  
[Appendices for Independence County SO2 Modeling Analysis v8.1 FINAL \(v15181\).pdf](#)

Guy,  
Here are the appendices as one document for the Independence County Report, hopefully.  
David

David W. Clark, M.S.  
Epidemiologist  
Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR. 72118  
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-----Original Message-----

From: Donaldson, Guy [mailto:Donaldson.Guy@epa.gov]  
Sent: Friday, January 13, 2017 4:35 PM  
To: Spencer, Stuart  
Cc: Stenger, Wren; Keogh, Becky; Montgomery, William; McCorkle, Mark; Coleman, Sam; Gray, David; Clark, David  
Subject: RE: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas (Independence County Report)

Stuart,

I don't see anything attached.

-----Original Message-----

From: Spencer, Stuart [mailto:SPENCER@adeq.state.ar.us]  
Sent: Friday, January 13, 2017 2:15 PM  
To: Donaldson, Guy <Donaldson.Guy@epa.gov>  
Cc: Stenger, Wren <stenger.wren@epa.gov>; keogh@adeq.state.ar.us; Montgomery, William <Montgomery@adeq.state.ar.us>; McCorkle, Mark <MAC@adeq.state.ar.us>; Coleman, Sam <Coleman.Sam@epa.gov>; Gray, David <gray.david@epa.gov>; Clark, David <CLARKD@adeq.state.ar.us>  
Subject: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas (Independence County Report)  
Importance: High



Guy,

Please find attached the Independence County modeling report (Entergy Independence facility and FutureFuel Chemical Company).

If you have any questions, please don't hesitate to contact me.

Sincerely,

Stuart Spencer  
Associate Director- Office of Air Quality Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR 72118  
Ph. # (501) 682-0750  
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## APPENDIX A: APRIL 2016 MODELING PROTOCOL

---





April 27, 2016

Guy Donaldson  
Chief, Air Planning Section  
U.S. EPA Region 6  
1445 Ross Avenue, Suite 1200  
Dallas, Texas 75202-2733

Subject: Request to Use the Adjusted\_U\* Beta Option for the FutureFuel Chemical Company 1-Hour SO<sub>2</sub> NAAQS Modeling Project

Dear Mr. Donaldson:

Through this letter, the Arkansas Department of Environmental Quality (ADEQ) is asking the U.S. Environmental Protection Agency (U.S. EPA) Region 6 (R6) to allow FutureFuel Chemical Company (FutureFuel) sited within Independence County, Arkansas to use EPA's proposed algorithm for adjusting the friction velocity (ADJ\_U\*) within the AERMOD Modeling System. When AERMOD is run with a meteorological dataset derived from one-minute meteorological data, as is currently recommended by the U.S. EPA, low wind speeds are more prevalent than when the modeling system did not rely on one-minute meteorological data. The more frequent inclusion of data that includes low wind speeds have been linked to potential underestimates of friction velocity (U\*) in AERMET and therefore, overestimates in ambient concentrations by AERMOD.<sup>1</sup> The U.S. EPA recognized this potential underestimation in AERMET and released AERMET Version 12345 which included the beta option, ADJ\_U\* and on July 29, 2015 the EPA also proposed the ADJ\_U\* algorithm as part of a revision to their Appendix W of 40 CFR Part 51, *Guideline on Air Quality Models* (Appendix W). The ADJ\_U\* beta option allows the friction velocity to be adjusted to better account for turbulence in the atmosphere during low wind speed stable conditions.

On June 3, 2010, the U.S. EPA set a 1-hour "primary" National Ambient Air Quality Standard for SO<sub>2</sub> at 75 parts per billion (ppb). On August 21, 2015, the U.S. EPA promulgated the 1-hour Sulfur Dioxide (SO<sub>2</sub>) Data Requirements Rule (DRR) whereby states use predictive dispersion modeling or monitoring to evaluate specific contributors of SO<sub>2</sub> whose annual emissions exceed 2,000 tons per year (tpy). On January 8, 2016, ADEQ submitted a letter to the U.S. EPA R6 identifying sources as required by the SO<sub>2</sub> DRR that included FutureFuel with actual emissions of 3,174.31 tpy (2014 reporting year). Based on dispersion modeling, on September 11, 2015, ADEQ submitted 2010 SO<sub>2</sub> 1-hour NAAQS designations to the U.S. EPA R6. On February 11, 2016, ADEQ received a response from the U.S. EPA R6 outlining the U.S. EPA's preliminary

---

<sup>1</sup> Wenjun Qian and Akula Venkatram, "Performance of Steady State Dispersion Models Under Low Wind-Speed Conditions," *Boundary-Layer Meteorology*, no. 138 (2011): 475-491.



response to identify Independence County, Arkansas as Unclassifiable based on insufficient information for a determination. To this end, FutureFuel and Entergy Independence Steam Electrical Station (Entergy), along with ADEQ, have undertaken a combined SO<sub>2</sub> predictive dispersion modeling project that considers both FutureFuel and Entergy emissions in the analysis.

Arkansas Regulation 19.412(A) requires applications of air quality modeling to be based on the requirements of Appendix W and 19.412(B) requires the applicant to receive written approval from the EPA for any modification or substitution. Section 3.2.2.b of Appendix W requires that the alternative approach is more appropriate than the preferred air quality model and also states that the request must meet at least one of three conditions, which are summarized below:

1. The alternative and preferred model provide equivalent estimates;
2. The alternative model outperforms the preferred model when comparing the results to actual air quality data; or
3. The preferred model is less appropriate or there is no preferred model for the given scenario.

As described in detail in FutureFuel's April 13, 2016 request to ADEQ (enclosed), ADEQ, FutureFuel and Entergy believe this request to the U.S. EPA meets the third criteria of Appendix W, Section 3.2.2.b. Because the U.S. EPA has noted that AERMOD has the potential to overestimate ambient concentrations during low wind speed conditions and has been developing the ADJ\_U\* algorithm since at least 2012 to help mitigate the problem, the U.S. EPA has now formally proposed the use of this algorithm on a routine basis<sup>2</sup> and has conducted a number of modeled to measured comparisons to support their proposal making the preferred model less appropriate for this situation. Appendix W, Section 3.2.2.e provides five criteria that must be met to use an alternative refined model. FutureFuel, Entergy and ADEQ have reviewed these five criteria and believe that within the context of this modeling project, applying ADJ\_U\* in AERMET to produce a meteorological file to be used in AERMOD will produce valid and more representative results for the modeling domain in the vicinity of the facility.

The detailed responses to each of the five criteria in Section 3.2.2.e are provided in Appendix A of FutureFuel's April 13, 2016 request to ADEQ. For 3.2.2.e.i (Scientific Peer Review), the use of an adjusted friction velocity in AERMOD has received substantial scientific peer review both within the U.S. EPA as well as by others in the scientific community. Regarding 3.2.2.e.ii (Applicable On A Theoretical Basis), when the threshold velocities of the National Weather Service anemometers were 1 meter per second (m/s) and greater the modeling community began to recognize that winds lower than 1 m/s would result in ambient concentration estimates that were not in line with ambient monitored values under the same conditions and that concentrations were inversely proportional to wind speed which greatly increased impacts at wind speeds below 1 m/s. More recently, many scientific studies have noted that Gaussian dispersion models tend to over predict concentrations at low wind speeds. To address 3.2.2.e.iii (Availability Of Databases), the databases applicable to this discussion are available and adequate. Section 3.2.2.e.iv (Demonstration Of No Bias Towards

---

<sup>2</sup> [https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR\\_AppendixW\\_Proposal.pdf](https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR_AppendixW_Proposal.pdf)



Underestimates) is buttressed by a number of studies, including a U.S. EPA model performance evaluation, that show that the use of ADJ\_U\* has not shown any bias toward underestimating the ambient concentrations. For Section 3.2.2.e.v (A Protocol Has Been Established), the enclosed document serves as the modeling protocol and clearly identifies all of the data resources and modeling methodology being proposed for use in the before-mentioned SO2 Attainment analysis.

For the reasons described above and elaborated on in FutureFuel's request, please grant permission to use the ADJ\_U\* option in an ambient demonstration to be conducted in support of ADEQ's September 11, 2015 submittal of 2010 Sulfur dioxide (SO<sub>2</sub>) 1-hour NAAQS designations to the EPA.

If you have any questions regarding this request, please contact me at (501) 683-0873 or [spencer@adeq.state.ar.us](mailto:spencer@adeq.state.ar.us) or Mark McCorkle at (501) 682-0736 or [mac@adeq.state.ar.us](mailto:mac@adeq.state.ar.us).

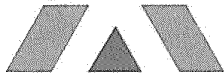
Sincerely,

A handwritten signature in black ink, appearing to read 'Stuart Spencer', with a long horizontal line extending to the right.

Stuart Spencer  
Associate Director  
Office of Air Quality  
Arkansas Department of Environmental Quality

cc: Erik Snyder, U.S. EPA Region 6





11225 Huron Lane | Suite 212 | Little Rock, AR 72211 | P (501) 225-6400 | F (501) 325-4488

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VIA E-MAIL TO: [mac@adeq.state.ar.us](mailto:mac@adeq.state.ar.us)

April 13, 2016

Mark McCorkle  
Environmental Program Coordinator  
ADEQ, Office of Air Quality – Planning Branch  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

RE: *FutureFuel Chemical Company (AFIN: 32-00036)*  
*1-Hour SO<sub>2</sub> NAAQS Modeling Protocol*

Dear Mr. McCorkle:

FutureFuel Chemical Company (FutureFuel) is a supplier of specialty organic chemical intermediates used in various manufacturing processes, and is located in Batesville, Arkansas. Per our recent discussions, FutureFuel has prepared the enclosed modeling protocol detailing how the 1-hour SO<sub>2</sub> NAAQS Attainment Demonstration will be conducted. The document is being provided for ADEQ's review and approval. Per our February 29 conference call with you and U.S. EPA, justification for the use of AERMOD model beta options, i.e., ADJ\_U\* met data, is included in Appendix A of the protocol.

FutureFuel is requesting that ADEQ provide written approval of this modeling protocol at their earliest convenience. Additionally, FutureFuel understands that ADEQ will submit the protocol to EPA for approval, including EPA Modeling Clearinghouse approval of the beta options. FutureFuel requests that we be copied on all correspondence to/from EPA regarding questions, comments, and approval of the protocol.

If you have any questions or comments about the information presented in this letter, please do not hesitate to contact me at (501) 225-6400 or via e-mail to [cbuttry@trinityconsultants.com](mailto:cbuttry@trinityconsultants.com).

Sincerely,

TRINITY CONSULTANTS

Charles R. (Chuck) Buttry  
Regional Manager, Southeast

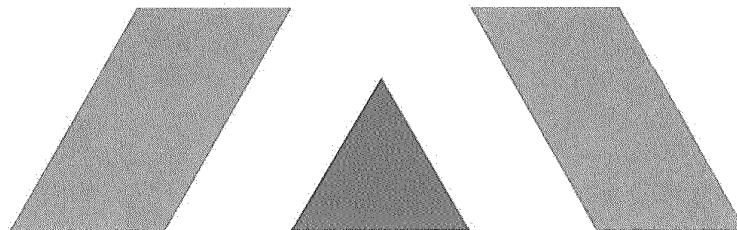
Enclosure: 1-Hour SO<sub>2</sub> NAAQS Modeling Protocol

cc: Mr. Philip Antici, FutureFuel Chemical Company ([philipantici@ffemail.com](mailto:philipantici@ffemail.com))  
Ms. Ann Faitz, Faitz Law Firm ([annfaitz@faitzlawfirm.com](mailto:annfaitz@faitzlawfirm.com))

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USA | China | Middle East





## 1-HOUR SO<sub>2</sub> NAAQS MODELING PROTOCOL

FutureFuel Chemical Company

Batesville, Arkansas

AFIN 32-00036



Prepared By:

Charles R. (Chuck) Buttry – Regional Manager, Southeast

Brian Holland – Senior Scientific Software Specialist

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April 2016

Project 150401.0130



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## 1. INTRODUCTION

---

Under the final U.S. Environmental Protection Agency (EPA) Sulfur Dioxide (SO<sub>2</sub>) Data Requirements Rule (DRR) promulgated on August 21, 2015, state air agencies will seek SO<sub>2</sub> predictive modeling or actual monitoring information for categories of sources based on annual SO<sub>2</sub> emission rates. The focus of the final DRR is on areas with sources whose actual annual SO<sub>2</sub> emissions exceed 2,000 tons per year (tpy). EPA's rationale for using predictive dispersion modeling is the dearth of representative ambient SO<sub>2</sub> monitors and EPA's view that SO<sub>2</sub> is a "source-oriented" criteria pollutant that is relatively stable in the first few kilometers from the source. Thus, this rule directs agencies to focus on specific sources as the main contributors to SO<sub>2</sub> air quality impacts and the way to ascertain those potential source contributions will be through dispersion modeling.

On January 8, 2016, the Arkansas Department of Environmental Quality (ADEQ) submitted a letter to EPA Region 6 regarding SO<sub>2</sub> sources identified pursuant to 40 CFR 51.1202 as required by the DRR for the 1-hour SO<sub>2</sub> National Ambient Air Quality Standard (NAAQS). ADEQ identified FutureFuel Chemical Company (FutureFuel) as a source with actual annual SO<sub>2</sub> emissions of 2,000 tons or more for the 2014 reporting year (i.e., 3,174.31 tpy).

FutureFuel contracted with Trinity Consultants to prepare an SO<sub>2</sub> modeling protocol and complete an SO<sub>2</sub> modeling analysis according to the DRR. Per FutureFuel's discussion with the ADEQ, the FutureFuel modeling analysis will include the actual SO<sub>2</sub> emissions from the nearby Entergy Independence Steam Electric Station (Entergy). According to the March 2, 2015, agreement (Consent Decree) between U.S. EPA and environmental groups, ADEQ was required to designate the area around Entergy plant "early" (no later than July 2, 2016) since Entergy's Independence Station met the Consent Decree criteria. In support of this early designation, Entergy completed a modeling analysis of solely the Independence Station and submitted the results to ADEQ in the *SO<sub>2</sub> Air Dispersion Modeling Report for Independence Steam Electric Station, ERM Project No. 0268066*, dated August 2015 (the August 2015 report). On September 11, 2015, Governor Hutchinson recommended to EPA that Independence County be designated as "Unclassifiable/Attainment". This recommendation was based on the Entergy modeling analysis. Per ADEQ's request, FutureFuel will complete a combined SO<sub>2</sub> modeling analysis, considering both FutureFuel and Entergy emissions in their analysis.

The 1-hour SO<sub>2</sub> characterization modeling will adhere to the following guidance documents: the February 2016 "SO<sub>2</sub> NAAQS Designations Modeling Technical Assistance Document" (TAD) issued in draft form by the EPA, the final DRR for the 2010 1-hour SO<sub>2</sub> primary NAAQS, and any direction received from the ADEQ Air Division Planning Branch. The 1-hour SO<sub>2</sub> characterization modeling will be conducted using AERMOD (version 15181) using default model options (unless otherwise noted in this document), meteorological data from 2012-2014 as described in Section 3.5, and the actual 2012-2014 emissions rates discussed in Section 3.3. Modeled concentrations will be predicted over the extensive receptor grid described in Section 3.6, and will include an ambient background concentration as described in Section 3.4.

The modeled concentrations predicted by AERMOD (including background) will be calculated based on the form of the 1-hour SO<sub>2</sub> NAAQS. The total design concentration will be compared to the 1-hour SO<sub>2</sub> primary NAAQS to determine if the area surrounding FutureFuel and Entergy should be designated as attainment or non-attainment.

The results of the analysis will be documented in a report submitted to ADEQ, which will also include a complete electronic modeling archive on CD.



## 2. FACILITY DESCRIPTION

This section presents a description of the FutureFuel facility location and site characteristics required as part of the air dispersion modeling evaluation.

### 2.1. FACILITY LOCATION

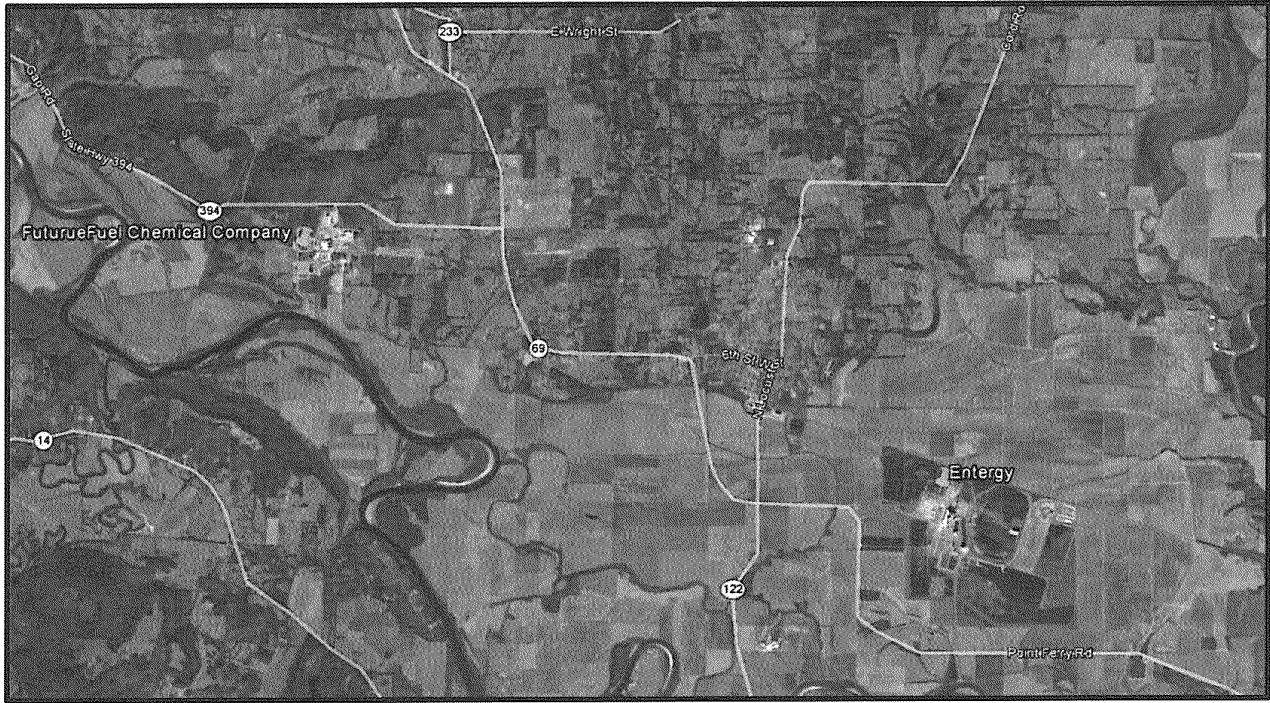
FutureFuel is located approximately 12 kilometers (km) southeast of Batesville in Independence County, Arkansas. Figure 2-1 provides a map of the area surrounding FutureFuel's property. The approximate central Universal Transverse Mercator (UTM) coordinates of the facility are 633,080 meters (m) east and 3,953,700 m north in Zone 15 [North American Datum 1983 (NAD 83)]. As shown in Figure 2-1, the facility is located in a very rural area of the White River valley, comprised of mixed forest and agricultural land with flat, rolling and hilly terrain all nearby.



Figure 2-1. Aerial Map of Area Surrounding FutureFuel Facility



Figure 2-2 shows the relative locations of FutureFuel and Entergy. Entergy is located approximately 11.4 kilometers southeast of FutureFuel and is in an area of generally flat terrain.



**Figure 2-2 Relative Locations of FutureFuel and Entergy**

Figure 2-3 shows an aerial map of FutureFuel with the SO<sub>2</sub> sources labeled. Figure 2-4 presents a plot plan of FutureFuel showing the major buildings and SO<sub>2</sub> sources. Refer to Entergy's August 2015 report for more details about their site and SO<sub>2</sub> emissions.





**Figure 2-3. Aerial Map of FutureFuel Facility**







### 3. DISPERSION MODELING ANALYSIS

---

This section presents the input data and modeling methodology that will be utilized in the SO<sub>2</sub> NAAQS modeling demonstration. The modeling methodology generally conforms to the Modeling TAD.<sup>1</sup>

#### 3.1. MODEL SELECTION

Modeling will be performed for the 1-hour SO<sub>2</sub> analysis following the Modeling TAD. The AERMOD Model Version 15181<sup>2</sup>, the most current version released by EPA on July 24, 2015 on the Support Center for Regulatory Air Modeling (SCRAM) website<sup>3</sup>, will be used to perform the dispersion modeling. The proposed update to EPA's modeling guidance in the form of the *Guideline on Air Quality Models*<sup>4</sup>, was released on July 15, 2015 via the EPA technical website.<sup>5</sup>

#### 3.2. SOURCE DESCRIPTION

All SO<sub>2</sub> emitting sources at FutureFuel will be modeled except for five very small SO<sub>2</sub> sources (less than 3.8 lb/hr total) and per EPA's clarification memorandum, intermittent emergency sources such as an emergency diesel-fired generator and fire water pump engines.<sup>6</sup> The modeled sources account for 98.5% of allowable SO<sub>2</sub> emissions from the facility. Additionally, SO<sub>2</sub> emitting sources from the nearby Entergy plant will be modeled. Table 3-1 presents a table of the sources that will be modeled and their locations. All locations are expressed in UTM Zone 15 coordinates.

---

<sup>1</sup> <https://www3.epa.gov/airquality/sulfurdioxide/pdfs/SO2ModelingTAD.pdf>

<sup>2</sup> Stated by U.S. EPA to be part of the docket at Docket ID No. EPA-HQ-OAR-2015-0310 and available as of date of submittal of this report.

<sup>3</sup> [http://www.epa.gov/ttn/scram/dispersion\\_prefrec.htm#aermod](http://www.epa.gov/ttn/scram/dispersion_prefrec.htm#aermod)

<sup>4</sup> *Guideline on Air Quality Models*. Appendix W to 40 CFR Parts 51 and 52. Federal Register, November 9, 2005. pp. 68217-68261.

<sup>5</sup> [https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR\\_AppendixW\\_Proposal.pdf](https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR_AppendixW_Proposal.pdf)

<sup>6</sup> [https://www3.epa.gov/ttn/scram/guidance/clarification/Additional\\_Clarifications\\_AppendixW\\_Hourly-NO2-NAAQS\\_FINAL\\_03-01-2011.pdf](https://www3.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-NO2-NAAQS_FINAL_03-01-2011.pdf)



**Table 3-1. Modeled Source Locations**

Model ID	Description	UTM-E (m)	UTM-N (m)	Elevation (m)
FF_5N091	RTO	633,660.39	3,953,915.79	81.94
FF_6M01	Coal Fired Boilers	633,343.50	3,953,692.29	83.57
FF_6M03	Chemical Waste Destructor	633,336.15	3,953,628.65	81.50
FF_4P05	Hot Oil System	633,692.56	3,954,022.81	83.40
FF_5N092	Thermal Oxidizer/Caustic Scrubber	633,629.84	3,953,907.38	83.86
EN_SN01	Entergy Unit 1 Boiler	644,086.7	3,949,432.5	71.52
EN_SN02	Entergy Unit 2 Boiler	644,089.8	3,949,441.4	71.53
EN_SN05	Entergy Auxiliary Boiler	644,064.1	3,949,338.7	71.46
EN_SN20	Entergy Emergency Diesel Generator	643,993.0	3,949,472.0	71.58
EN_SN21	Entergy Emergency Diesel Fire Pump	644,011.0	3,949,296.0	71.43

All modeled sources are point sources and Table 3-2 presents the stack parameters that will be input to the model for each of the sources. Sources EN\_SN20 and EN\_SN21 discharge horizontally and as such will be modeled with a minimal exit velocity (0.001 m/s).



**Table 3-2. Modeled Source Parameters**

Model ID	Stack Height (m)	Stack Temperature (K)	Exit Velocity (m/s)	Stack Diameter (m)
FF_5N091	18.29	390.31	9.63	2.44
FF_6M01	60.96	485.26	14.42	2.74
FF_6M03	26.57	357.93	12.18	1.22
FF_4P05	5.20	477.60	2.70	0.46
FF_5N092	7.62	345.15	9.27	0.24
EN_SN01	304.8	433.71	27.43	7.83
EN_SN02	304.8	433.71	27.43	7.83
EN_SN05	4.57	519.26	19.81	0.91
EN_SN20	4.27	790.54	0.001	0.25
EN_SN21	4.27	644.26	0.001	0.13

### 3.3. MODELED EMISSION RATES

As described in the Modeling TAD, attainment modeling demonstrations are intended to represent actual facility emissions. Four of the five FutureFuel units will use actual monthly average emissions data for the 2012-2014 period. For the lowest emitting unit (Thermal Oxidizer, Model ID 5N09\_02), the maximum hourly allowable permit limit (3.0 lb/hr SO<sub>2</sub>) was modeled as a worst-case. Three of the Entergy units (Model ID EN\_SN01, EN\_SN02, and EN\_SN05) will use actual hourly emissions data for the 2012-2014 model. The emergency fire pump (Model ID EN\_SN20) and emergency generator (Model ID EN\_SN21) at Entergy will use variable emission rates based on actual engine testing times as described in Entergy's August 2015 report. The EMISFACT option in AERMOD will be utilized to supply the varying monthly emission rates for the units with monthly emission rate data and to supply Entergy's emergency units with the variable emission rates for weekly testing times. Table 3-3 shows the annual average hourly emission rate for the FutureFuel sources for comparative purposes.



**Table 3-3. Average Hourly Modeled SO<sub>2</sub> Emission Rates**

Model ID	2012 Average Emission Rate (lb/hr)	2013 Average Emission Rate (lb/hr)	2014 Average Emission Rate (lb/hr)
FF_5N091	0.09	0.09	0.05
FF_6M01	561.53	604.68	697.43
FF_6M03	2.53	4.41	3.49
FF_4P05	0.00005	0.00006	0.00006
FF_5N092	3.00	3.00	3.00

Note: The Entergy emission rates are described in their August 2015 report.

### **3.4. BACKGROUND CONCENTRATIONS**

NAAQS modeling demonstrations typically include impacts from the applicant's facility and a background concentration from a representative ambient monitor. When including background concentrations, the potential for double-counting exists, where impacts from explicitly modeled sources may also be included in the concentration measured by the ambient monitor. In their "Clarification Memorandum for 1-hour NO<sub>2</sub> Modeling" (*herein referred to as 1-hour NO<sub>2</sub> Guidance*), EPA provides a general "rule-of-thumb" for estimating the area over which regional inventory sources should be included. That section of the guidance goes on to suggest that for most applications, the inclusion of nearby sources within about 10 km would be sufficient. This guidance is based on the concept of "significant concentration gradient" in which modeled impacts from a given facility are reviewed to determine how quickly concentrations diminish out from the site. Although Entergy is over 11 km from FutureFuel, the SO<sub>2</sub> emissions from Entergy will be included in the model.

Ambient background data from the closest SO<sub>2</sub> monitor, located in Little Rock (Monitor ID# 05-119-0007), will be used to represent other sources of SO<sub>2</sub> in the background. The only other SO<sub>2</sub> monitor in Arkansas is located in El Dorado in the southern portion of the state. EPA Guidance allows the inclusion of background values that vary by season and hour of day that could simulate a lower value than the 99<sup>th</sup> percentile design value from the monitor. The modeling will be performed with a set of seasonal diurnal values developed using methodology described in the *1-hour NO<sub>2</sub> Guidance* which addresses NO<sub>2</sub> modeling and the process for developing seasonal diurnal background values for SO<sub>2</sub>. Table 3-4 shows the seasonal diurnal values that will be used in the model.

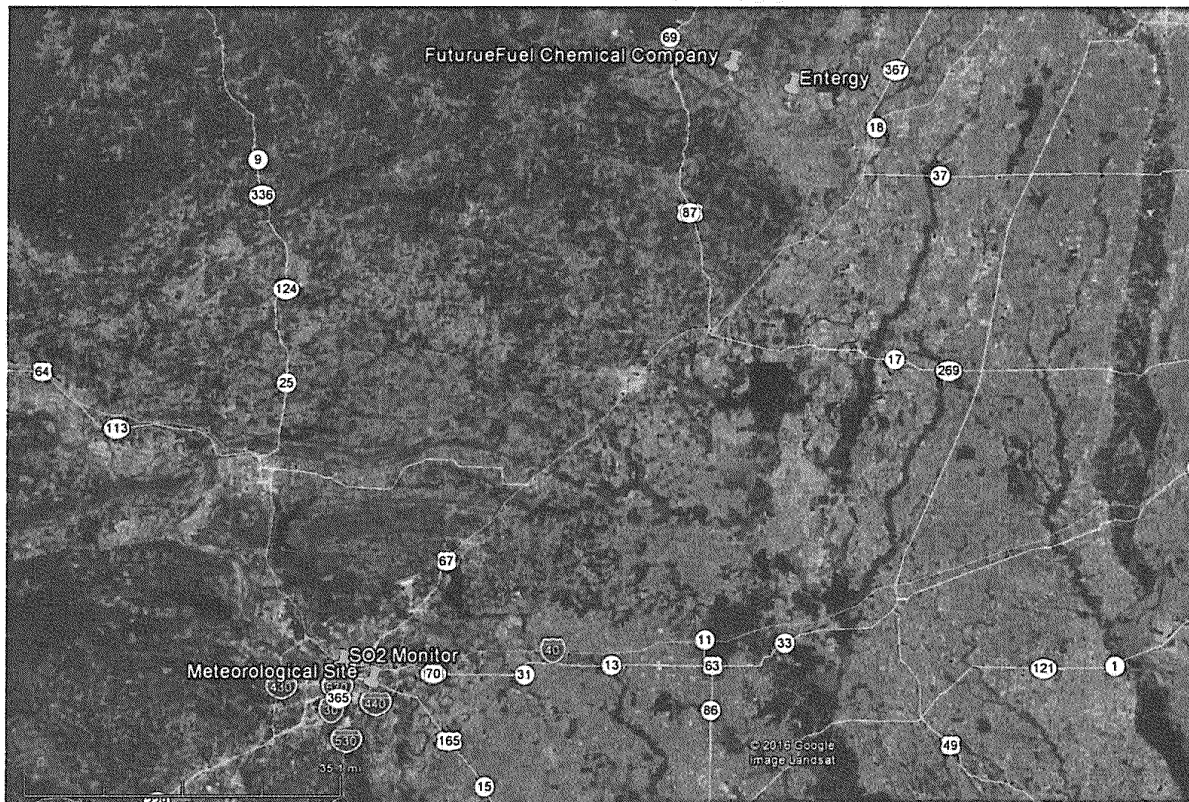


**Table 3-4. Seasonal Diurnal SO<sub>2</sub> Concentrations at Little Rock Monitor**

Hour	Winter (µg/m <sup>3</sup> )	Spring (µg/m <sup>3</sup> )	Summer (µg/m <sup>3</sup> )	Fall (µg/m <sup>3</sup> )
1	6.89	5.67	4.80	5.50
2	7.85	5.32	4.28	6.19
3	7.33	6.19	4.45	6.02
4	6.89	5.76	4.19	4.71
5	8.55	4.97	4.19	5.15
6	9.60	4.80	5.41	5.85
7	9.60	6.28	5.50	6.63
8	8.99	5.24	6.11	6.54
9	7.50	6.46	7.68	7.85
10	8.38	8.20	7.42	9.07
11	9.16	8.46	9.95	8.20
12	10.73	15.09	10.38	9.34
13	9.69	11.08	10.91	11.17
14	10.56	9.34	9.86	9.51
15	10.03	8.20	13.18	9.95
16	9.42	7.94	9.34	10.47
17	7.15	9.86	11.08	9.16
18	7.50	7.42	9.69	7.24
19	9.25	6.37	9.86	6.98
20	12.30	6.54	8.73	5.93
21	9.07	6.02	6.19	6.28
22	6.11	8.99	5.76	5.67
23	6.46	7.07	5.67	5.85
24	7.24	6.81	5.41	6.11



Figure 3-1 shows the relative locations of the FutureFuel facility, Entergy, the meteorological site and the SO<sub>2</sub> monitor.



**Figure 3-1. Relative Locations of FutureFuel Facility, Entergy, Meteorological Site, and SO<sub>2</sub> Monitor**

### 3.5. METEOROLOGICAL DATA

AERMOD-ready meteorological data for the period 2012-2014 was prepared using the latest version of the EPA's AERMET meteorological processing utility (version 15181) and will be used for this analysis. Standard EPA meteorological data processing guidance was used as outlined in a recent memorandum<sup>7</sup> and other documentation.

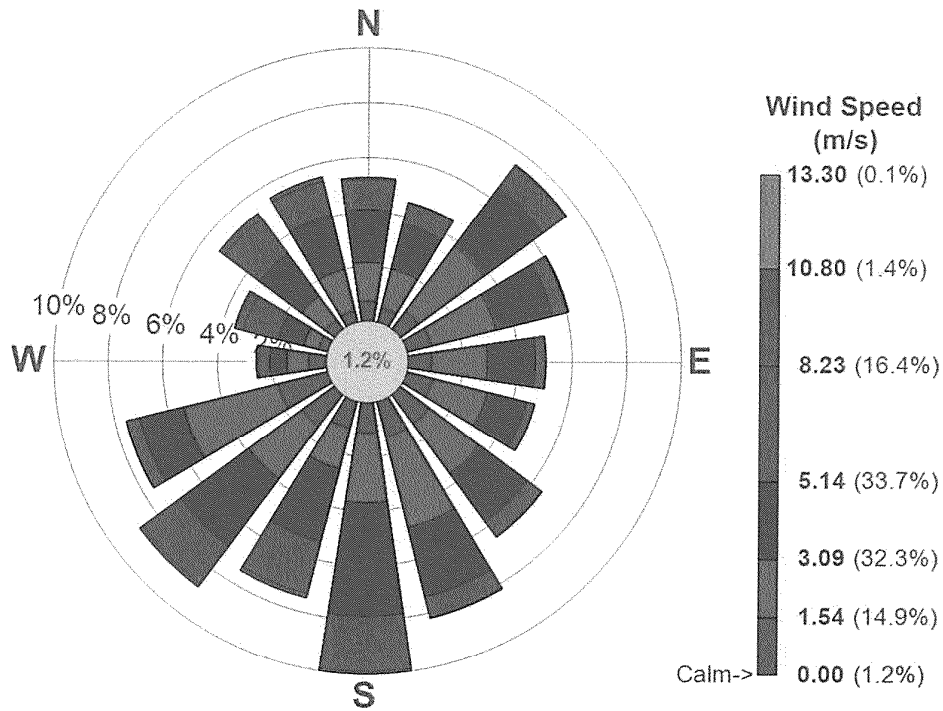
#### 3.5.1. Surface Data

Raw hourly surface meteorological data was obtained from the U.S. National Climatic Data Center (NCDC) for Little Rock Clinton National Airport/Adams Field (KLIT, WMO ID: 722310) in the standard ISHD format. This data was supplemented with TD-6405 (commonly referred to as "1-minute ASOS") wind data from KLIT. The 1-

<sup>7</sup> Fox, Tyler, U.S. Environmental Protection Agency. 2013. "Use of ASOS Meteorological Data in AERMOD Dispersion Modeling." Available Online: [http://www.epa.gov/ttn/scram/guidance/clarification/20130308\\_Met\\_Data\\_Clarification.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/20130308_Met_Data_Clarification.pdf)



minute wind data was processed using the latest version of the EPA AERMINUTE pre-processing tool (version 15272). Quality of the 1-minute data was verified by comparison to the hourly ISHD data from KLIT, which showed only small differences typical of 1-minute and hourly wind data comparisons. The “Ice-Free Winds Group (IFWG)” option was utilized in AERMINUTE due to the fact that a sonic anemometer was installed at KLIT on May 21, 2009.<sup>8</sup> As such, the IFWG option was engaged for the full 2012-2014 period. Figure 3-2 shows the distribution of wind speed and direction for the site.



**Figure 3-2. 2012-2014 Wind Rose for Little Rock Airport (KLIT)**

### 3.5.2. Upper Air Data

In addition to surface meteorological data, AERMET requires the use of data from a sunrise-time upper air sounding to estimate daytime mixing heights. The nearest U.S. National Weather Service (NWS) upper-air radiosonde station is located in Little Rock, AR (LZK). Upper air data for the same 2012-2014 time period were obtained from the National Oceanic and Atmospheric Administration (NOAA) in FSL format.<sup>9</sup>

<sup>8</sup> [http://www.nws.noaa.gov/ops2/Surface/documents/IFW\\_stat.pdf](http://www.nws.noaa.gov/ops2/Surface/documents/IFW_stat.pdf)

<sup>9</sup> <http://esrl.noaa.gov/raobs/>



### 3.5.3. Land Use Analysis

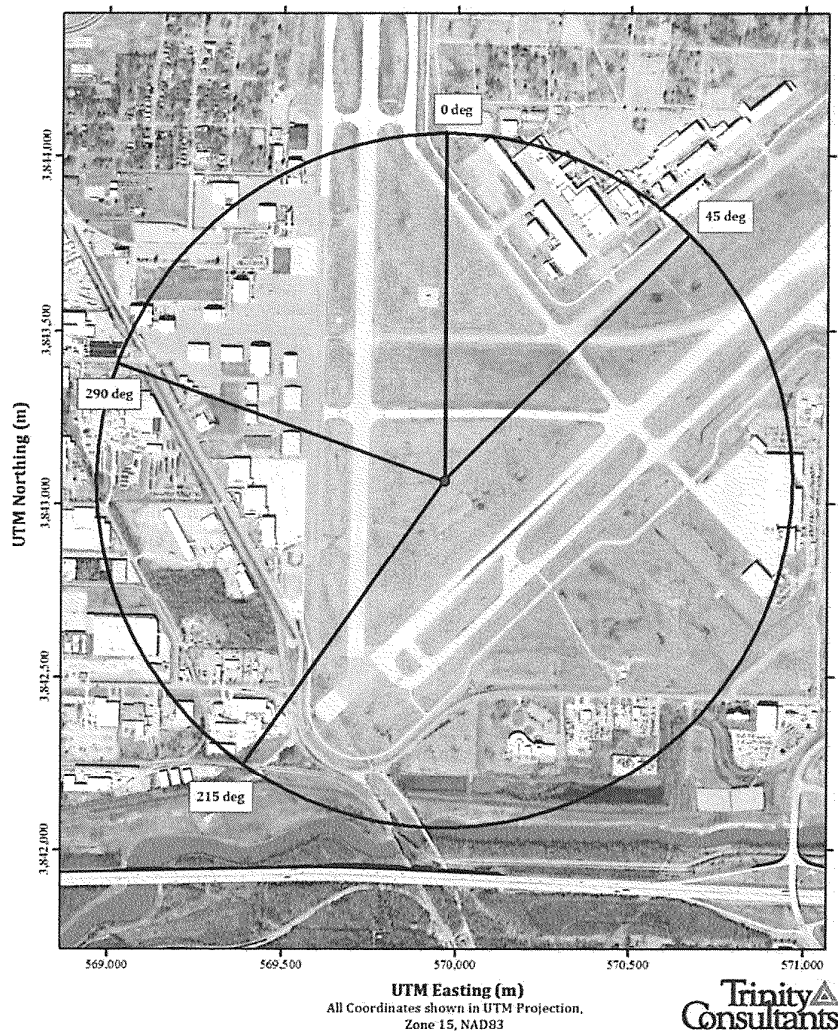
Parameters derived from the analysis of land use data (surface roughness, Bowen ratio, and albedo) are also required by AERMET. In accordance with EPA guidance, these values will be determined using the latest version of the EPA AERSURFACE tool (version 13016).<sup>10</sup> The AERSURFACE settings that will be used for processing are summarized in Table 3-5. The met station coordinates were determined by visually identifying the met station in Google Earth. NLCD 1992 (CONUS) Land Cover data that will be used in AERSURFACE processing was obtained from the Multi-Resolution Land Use Consortium (MRLC).

EPA recommendations were used to specify the area used for the AERSURFACE analysis. Surface roughness was estimated based on land use within a 1 km radius of the meteorological station, with directional variation in roughness accounted for by dividing that circle into sectors with common landuse types. By default, AERSURFACE assumes twelve 30-degree landuse sectors. In cases where the landuse is uniform, that is an acceptable approach. However, in the case of the LIT airport, there are four (4) directional sectors with truly distinct landuse categories. Figure 3-3 shows the wind direction sectors input to AERSURFACE for the surface roughness portion of the landuse analysis.

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<sup>10</sup> U.S. Environmental Protection Agency. 2013. "AERSURFACE User's Guide." EPA-454/B-08-001, Revised 01/16/2013. Available Online: [http://www.epa.gov/scram001/7thconf/aermod/aersurface\\_userguide.pdf](http://www.epa.gov/scram001/7thconf/aermod/aersurface_userguide.pdf)





**Figure 3-3. AERSURFACE Land Use Sector Analysis**

Albedo and Bowen ratio are regional parameters and were estimated within AERSURFACE, based on the default 10x10 km box centered on the meteorological station.

EPA guidance dictates that on at least an annual basis, precipitation at a surface site should be classified as wet, dry, or average in comparison to the 30-year climatological record at the site. This determination is used to adjust the Bowen ratio estimated by AERSURFACE. To make the determination, annual precipitation in each



modeled year (2012-2014) was compared to the 1981-2010 climatological record for KLIT.<sup>11</sup> The 30<sup>th</sup> and 70<sup>th</sup> percentile values of the annual precipitation distribution from 1981-2010 were calculated. Per EPA guidance, each modeled year was classified for AERSURFACE processing as “wet” if its annual precipitation was higher than the 70<sup>th</sup> percentile value, “dry” if its annual precipitation was lower than the 30<sup>th</sup> percentile value, and “average” if it was between the 30<sup>th</sup> and 70<sup>th</sup> percentile values. The values that will be used in this case are included in Table 3-5.

The site location does not experience meteorological seasons like the default seasonal categories in AERSURFACE, therefore the monthly categories were modified to better represent the meteorological seasons the site experiences. The modified seasons are shown in Table 3-6.

**Table 3-5. AERSURFACE Input Parameters**

AERSURFACE Parameter	Value
Met Station Latitude	34.727266
Met Station Longitude	-92.235811
Datum	NAD 1983
Radius for surface roughness (km)	1.0
Vary by Sector?	Yes
Number of Sectors	4 (0-45, 45-215, 215-290, 290-360)
Temporal Resolution	Seasonal
Continuous Winter Snow Cover?	No
Station Located at Airport?	Yes
Arid Region?	No
Surface Moisture Classification	Dry (2012), Wet (2013), Average (2014)

**Table 3-6 Modified AERSURFACE Seasons**

Seasonal Category	Season Description	Month Assignments
1	Midsummer with lush vegetation	May, Jun, Jul, Aug, Sept
2	Autumn with unharvested cropland	Oct, Nov
3	Late autumn after frost and harvest, or winter with no snow	Dec, Jan, Feb
5	Transitional spring with partial green coverage or short annuals	Mar, Apr

<sup>11</sup> National Climatic Data Center. 2010 Local Climatological Data (LCD), (KMSY).



### 3.5.4. AERMET Processing Options

EPA released AERMET Version 12345 which included a beta option, ADJ\_U\*, to better account for turbulence in the atmosphere during low wind speed stable conditions. Subsequent releases of AERMET have incorporated modifications to the ADJ\_U\* formulation to better address micrometeorological refinements (e.g. Bulk Richardson Number, low solar elevation angles). The ADJ\_U\* option adjusts the surface friction velocity parameter (U\*) used by AERMET in certain low wind speed situations. This option, based on a peer-reviewed study<sup>12</sup>, was added to AERMET by EPA to address the tendency of AERMET/AERMOD to underestimate dispersion and thus overestimate ground-level pollutant concentrations for low-level sources under low wind speed conditions, especially for shorter-term averaging periods. Given the refined nature of this beta option and the peer reviewed studies which have acknowledged its accuracy, including EPA, FutureFuel has incorporated this AERMET option. A detailed justification for the use of ADJ\_U\* is contained in Appendix A.

The AERMET data processing procedure utilized regulatory default options in this case<sup>13,14</sup> with the exception of the ADJ\_U\* option. The options selected include:

- MODIFY keyword for upper air data
- THRESH\_1MIN 0.5 keyword to provide a lower bound of 0.5 m/s for 1-minute wind data
- AUDIT keywords to provide additional QA/QC and diagnostic information
- ASOS1MIN keyword to incorporate 1-minute wind data
- NWS\_HGT WIND 10 keyword to designate the anemometer height as 10 meters
- METHOD WIND\_DIR RANDOM keyword to correct for any wind direction rounding in the raw ISHD data
- METHOD REFLEVEL SUBNWS keyword to allow use of airport surface station data
- Default substitution options for cloud cover and temperature data were not overridden
- Default ASOS\_ADJ option for correction of truncated wind speeds was not overridden
- ADJ\_U\* beta option was used

### 3.6. MODELED RECEPTORS

A comprehensive Cartesian receptor grid extending out to approximately 20 kilometers from FutureFuel and Entergy will be used in the AERMOD modeling analysis to assess maximum ground level 1-hour SO<sub>2</sub> concentrations. The Modeling TAD states that the receptor grid must be sufficient to determine ambient air quality in the vicinity of the source being studied. Preliminary modeling analyses were conducted to determine appropriate extents for the modeled receptor grids, which will consist of the following:

- 50-meter spacing along both the facilities fencelines (fenceline grids);
- 100-meter spacing extending from the Entergy fenceline to 5 kilometers (Entergy fine grid);
- 100-meter spacing extending from the FutureFuel fenceline to 7 kilometers (FutureFuel fine grid);
- 200-meter spacing extending from 7 to 10 kilometers around FutureFuel (FutureFuel medium grid); and
- 500-meter spacing extending from 10 to 20 kilometers around FutureFuel (FutureFuel coarse grid); and

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<sup>12</sup> Qian and Venkatram. 2011. "Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions." *Boundary-Layer Meteorology*, Volume 138, Issue 3, pp 475-491.

<sup>13</sup> Fox, Tyler, U.S. Environmental Protection Agency. 2013. "Use of ASOS Meteorological Data in AERMOD Dispersion Modeling." Available Online: [http://www.epa.gov/ttn/scram/guidance/clarification/20130308\\_Met\\_Data\\_Clarification.pdf](http://www.epa.gov/ttn/scram/guidance/clarification/20130308_Met_Data_Clarification.pdf)

<sup>14</sup> U.S. Environmental Protection Agency. 2014. "User's Guide for the AERMOD Meteorological Preprocessor (AERMET)". EPA-454/B-03-002, November 2004).



- 1,000-meter spacing extending out 20 kilometers around both facilities (Overall coarse grid).

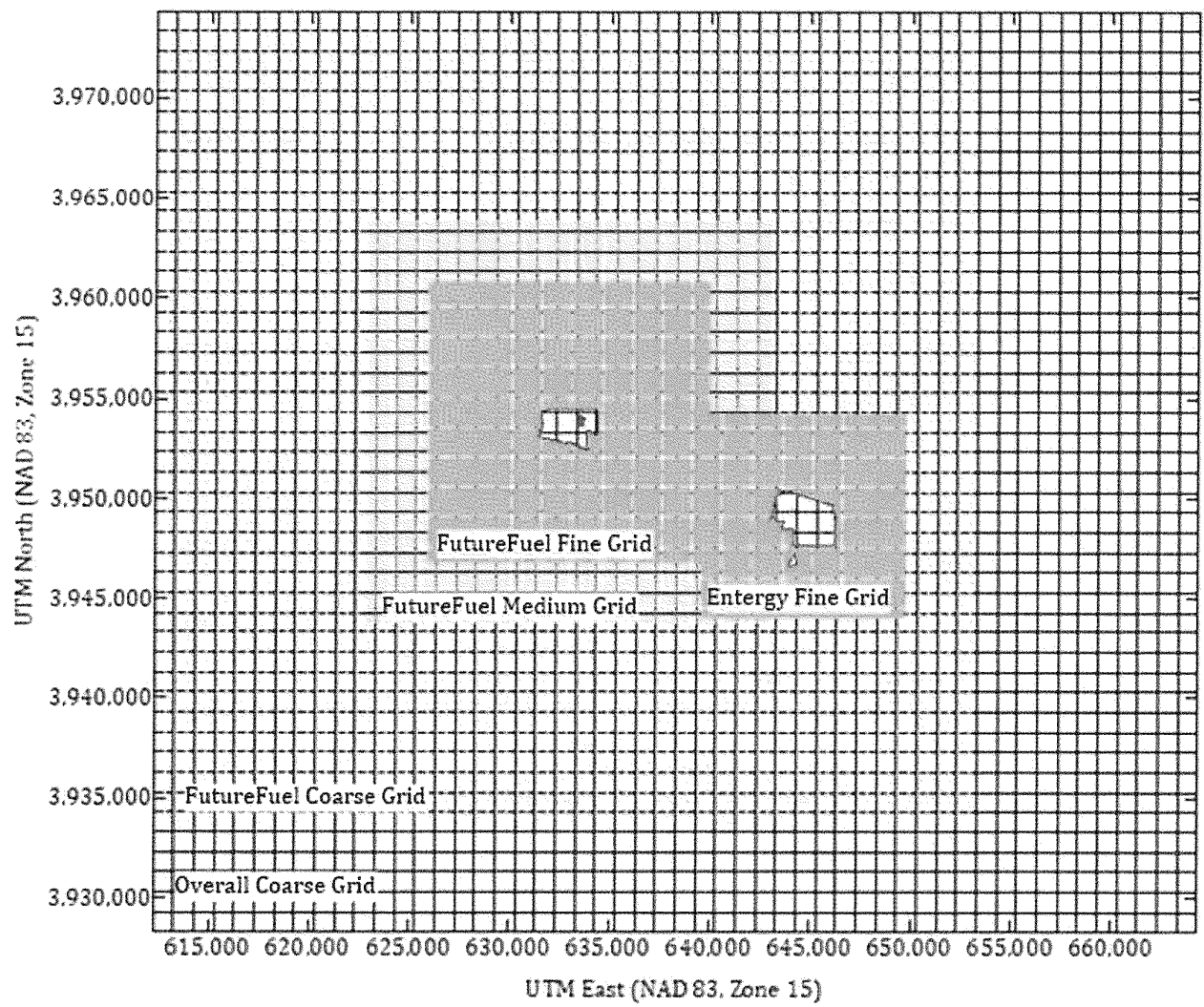
The above receptor data will be used without modification in the modeling. Per the Modeling TAD, a number of receptors located over the White River could be excluded from the modeling domain because ambient monitors could not reasonably be placed at these locations, but these receptors will be retained in this analysis as a measure of conservatism.

The AERMOD model is capable of handling both simple and complex terrain. Through the use of the AERMOD terrain preprocessor (AERMAP), AERMOD incorporates not only the receptor heights, but also an effective height (hill height scale) that represents the significant terrain features surrounding a given receptor that could lead to plume recirculation and other terrain interaction.<sup>15</sup> Receptor terrain elevations input to the model will be interpolated from National Elevation Database (NED) data obtained from the USGS. NED data consist of arrays of regularly spaced elevations. The array elevations will be at a resolution of 1 arc second (approximately 30 m intervals) and will be interpolated using the latest version of AERMAP (version 11103) to determine elevations at the defined receptor intervals. The receptor grids that will be modeled are shown in Figure 3-4.

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<sup>15</sup> US EPA *Users Guide for the AERMOD Terrain Preprocessor (AERMAP)*, EPA-454/B-03-003, Research Triangle Park, NC.





**Figure 3-4. Receptor Grids**



### 3.7. BUILDING DOWNWASH

AERMOD incorporates the Plume Rise Model Enhancements (PRIME) downwash algorithms. Direction specific building parameters required by AERMOD are calculated using the BPIP-PRIME preprocessor (version 04274). Downwash effects will be considered through the use of this program.

EPA has promulgated stack height regulations that restrict the use of stack heights in excess of “Good Engineering Practice” (GEP) in air dispersion modeling analyses. Under these regulations, that portion of a stack in excess of the GEP height is generally not creditable when modeling to determine source impacts. This essentially prevents the use of excessively tall stacks to reduce ground-level pollutant concentrations. However, since the DRR modeling process is determining attainment for the area around a facility, the TAD document appropriately recommends that actual stack heights be used.



## APPENDIX A: USE OF ADJ\_U\* IN FUTUREFUEL SO<sub>2</sub> DISPERSION MODELING

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When AERMOD is run with a meteorological dataset derived from one-minute meteorological data as is currently recommended by U.S. EPA, low wind speeds are much more prevalent than in prior versions of the modeling system that did not rely on one-minute meteorological data. These low wind speeds have been linked to potential overestimates in ambient concentrations by AERMOD.<sup>16</sup> These overestimates occur, in part, due to an underestimate of friction velocity ( $u^*$ ) by the AERMET meteorological processor. U.S. EPA recognized this underestimation as a potential issue with AERMET and released AERMET Version 12345 which included a beta option, ADJ\_U\*. The ADJ\_U\* beta option allows the friction velocity ( $u^*$ ) to be adjusted using the methods of Qian and Venkatram<sup>17</sup> to better account for turbulence in the atmosphere during low wind speed stable conditions. This beta option was updated to incorporate a modified Bulk Richardson Number methodology in version 13350, was further modified to adjust  $u^*$  for low solar elevation angles with version 14134, and was most recently used to modify the calculation of the turbulence measure, Monin-Obukhov length in Version 15181.<sup>18</sup> Given the refined nature of this beta option and the peer reviewed studies which have acknowledged its accuracy, FutureFuel is proposing to incorporate this option into the modeling analysis to allow more representative and more accurate modeling results.

The U.S. EPA has proposed to make the ADJ\_U\* option a regulatory default in the forthcoming revisions to the *Guideline*.<sup>19</sup> Currently, however, the  $u^*$  option is not a default option in AERMOD, the combined use of AERMOD plus the  $u^*$  adjustment in the meteorology file (generated by AERMET) would no longer have “preferred” status in the sense that it is a model to be used for regulatory purposes without additional regulatory authority approval. To substantiate that the adjusted friction velocity option in AERMOD is a valid model to use in this situation, Section 3.2 of Appendix W describes steps to be considered to allow the use of the  $u^*$  adjusted AERMOD as an acceptable alternative model. The section also describes criteria for determining the acceptability of an alternative model. Section 3.2.2.b states that satisfying any one of the three alternative conditions may make use of an alternative model acceptable. Condition 1 states that the alternative model will demonstrate equivalency. But in this case the AERMOD Model is the preferred model of choice with just an option change (making it alternative). Because the model cannot have a demonstration of equivalency to itself and the option change will result in different results, this condition is not applicable. This leaves the satisfaction of Conditions 2 and 3 as criteria to accept the  $u^*$  option in AERMOD. Condition 2 requires the formal submittal of a protocol to allow demonstration of superior performance which is acceptable to the control agency and to FutureFuel. This type of study would require appropriate ambient air quality monitoring and side-by-side modeling and comparisons which are well beyond the scope of this modeling demonstration.

Thus, Condition 3 was reviewed and followed along with the individual criteria to meet its requirements. Section 3.2.2.e states that an alternative refined model may be used provided that five criteria are met. These are:

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<sup>16</sup> Wenjun Qian and Akula Venkatram, “Performance of Steady State Dispersion Models Under Low Wind-Speed Conditions,” *Boundary-Layer Meteorology*, no. 138 (2011): 475-491.

<sup>17</sup> Ibid.

<sup>18</sup> [http://www.epa.gov/ttn/scram/7thconf/aermod/aermet\\_mcb3.txt](http://www.epa.gov/ttn/scram/7thconf/aermod/aermet_mcb3.txt);  
[http://www.epa.gov/ttn/scram/7thconf/aermod/aermet\\_mcb4.txt](http://www.epa.gov/ttn/scram/7thconf/aermod/aermet_mcb4.txt);  
[http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET\\_mcb5.pdf](http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET_mcb5.pdf);  
[http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET\\_mcb6.pdf](http://www.epa.gov/ttn/scram/7thconf/aermod/AERMET_mcb6.pdf)

<sup>19</sup> [https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR\\_AppendixW\\_Proposal.pdf](https://www3.epa.gov/ttn/scram/11thmodconf/9930-11-OAR_AppendixW_Proposal.pdf)



- i. The model has received a scientific peer review;
- ii. The model can be demonstrated to be applicable to the problem on a theoretical basis;
- iii. The data bases which are necessary to perform the analysis are available and adequate;
- iv. Appropriate performance evaluations of the model have shown that the model is not biased towards underestimates; and
- v. A protocol on methods and procedures to be followed has been established.

Review of these criteria as well as the responses to each within the context of modeling for FutureFuel have shown the use of the  $u^*$  option, as generated by AERMET in the meteorological file and used in AERMOD, to be valid and representative for the modeling domain in the vicinity of the facility. The response to each criteria is given in the following Appendix A subsections.

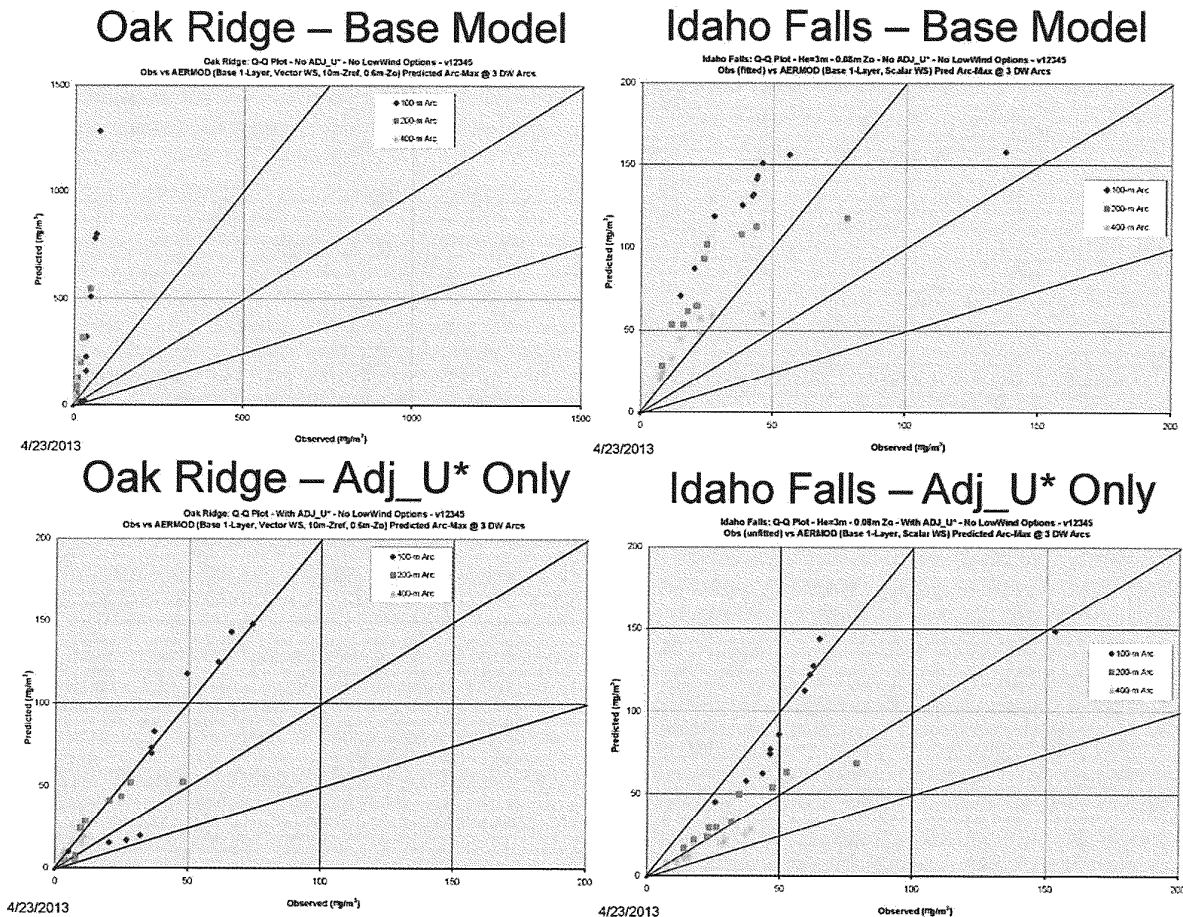
### CRITERIA 3.2.2.e.i - SCIENTIFIC PEER REVIEW

The use of an adjusted friction velocity in AERMOD has received scientific peer review and been evaluated both by U.S. EPA modelers as well as others in the scientific and modeling community. Three examples are:

- The paper entitled “Performance of Steady-State Dispersion Models Under Low Wind-Speed Conditions” by Wenjun Qian and Akula Venkatram, *Boundary Layer Meteorology*, Volume 138, pp 475-491, 2011. This paper examined the AERMOD Model to estimate dispersion under low wind speed events. Two tracer studies, the Prairie Grass Experiment and the Idaho Falls experiment, were compared to the use of AERMOD with and without  $u^*$  adjustments. The analysis reports that the tendency of AERMOD to overestimate ambient air impacts during low wind speed events was reduced by incorporating an empirical modification. This modification is incorporated into the AERMET program through the ADJ\_U\* keyword. This option generates the enhanced friction velocity datasets on a low wind speed, stable atmosphere, hour-by-hour basis. Also in his email memorandum dated June 26, 2013, George Bridgers of the U.S. EPA’s Office of Air Quality Planning and Standards, notes that “The AERMET BETA option is based on a peer reviewed study (Qian and Venkatram, 2011) which also includes independent evaluations of the new  $u$ -star estimates...”.
- In his April 23, 2013 presentation at the Regional/State/Local Modeling Meeting in Dallas, Texas, Roger Brode showed “improved AERMOD performance” when including the  $u^*$  adjustment. The figures below from Mr. Brode’s presentation demonstrate the enhanced performance of AERMOD for two field data bases, namely the Oak Ridge Study and the Idaho Falls Study. The closer the points are to the center line of each graph, the better the model performance.



Figure A-1. Comparison of the AERMOD Model with and without the  $u^*$  Adjustment



- The paper entitled “Evaluation of low wind modeling approaches for two tall-stack databases” by Robert Paine, Olga Samani, Mary Kaplan, Eladio Knipping and Naresh Kumar, Journal of the Air & Waste Management Association, 65:11, 1341-1353. This paper evaluates model performance for the LOWWIND options in AERMET and AERMOD for two databases: Mercer County, North Dakota and Gibson Power Station in Indiana. Since the Indiana database is in an area with flat terrain, it is not applicable to this modeling analysis. However, the North Dakota databases consists of tall stacks in rolling terrain, including monitor locations at elevations above stack base elevation, which is similar to the terrain surrounding the FutureFuel Chemical site. As shown in Table 4 of the paper, the predicted/observed impact ratios were improved from 2.20 to 1.53 for the monitor location (DGC #17) in the elevated terrain surrounding the sources.

### CRITERIA 3.2.2.e.ii - APPLICABLE ON A THEORETICAL BASIS

Over the past several years many scientific studies have noted that Gaussian dispersion models tend to over predict concentrations at low wind speeds. In the early days of dispersion modeling when the threshold velocities of the National Weather Service anemometers were a few miles per hour, the common use of 1 m/s as



the lowest wind speed that would be considered in the model was prevalent. The modeling community recognized that winds lower than that would result in ambient concentration estimates that were not coincidental with ambient monitored values at these same low wind speed conditions. Because concentration is inversely proportional to wind speed, impacts increase greatly as wind speeds fall below 1 m/s. In addition, other studies and field research showed that winds tend to meander during low wind speeds, meaning that the wind was not in only one direction during the time step of the Gaussian models, namely one hour, but tended to change over the time step. The relationship between this phenomenon and the friction velocity calculations in AERMET determined that adjusting the  $u^*$  could have the same effect as adjusting plume meander and was better estimated empirically (as demonstrated in the peer reviewed paper by Qian and Venkatram).

In reviewing the frequency distribution of winds from the Little Rock, AR Airport for the period of record of this modeling analysis, the number of hours in the range of 0.28 m/s (the lower limit where AERMOD will make a calculation) and 3.1 m/s wind speed is 12,414 hours over the three year period of record or 47.2%. In fact, the observed wind speeds are less than 2 m/s for 6,327 hours (24.1%) over the 2012-2014 modeling period. The overall distribution is shown in Table A-1. As previously discussed, the incorporation of the 1 minute ASOS wind observations has greatly reduced the number of calm (and thus unmodeled) hours and replaced them in many cases with low wind speed hours. Thus, the consideration of better science in terms of the  $u^*$  adjustment is applicable and reasonable given this relatively high frequency of low wind occurrences.

**Table A-1. Distribution of Hourly Observations by Wind Speed and Wind Direction**

Dir \ Spd	<= 1.54	<= 3.09	<= 5.14	<= 8.23	<= 10.80	> 10.80	Total
0.0	0.74	1.41	1.95	1.11	0.07	0.00	5.28
22.5	0.55	1.49	1.69	0.79	0.02	0.00	4.54
45.0	0.84	2.98	2.65	1.03	0.03	0.00	7.53
67.5	0.94	2.43	2.13	0.55	0.02	0.03	6.10
90.0	0.87	2.03	1.76	0.37	0.02	0.00	5.05
112.5	1.00	2.06	1.46	0.29	0.01	0.00	4.83
135.0	1.35	2.29	2.19	0.66	0.03	0.00	6.51
157.5	1.35	3.45	2.60	0.76	0.04	0.00	8.21
180.0	1.13	2.57	4.16	2.05	0.09	0.00	9.99
202.5	1.03	1.54	2.76	1.97	0.15	0.00	7.45
225.0	1.46	2.41	3.08	1.73	0.13	0.01	8.82
247.5	1.85	3.57	1.65	0.47	0.03	0.00	7.58
270.0	0.63	0.81	0.62	0.40	0.07	0.03	2.56
292.5	0.34	0.56	0.97	1.32	0.29	0.05	3.53
315.0	0.42	1.08	1.94	1.60	0.23	0.01	5.28
337.5	0.44	1.56	2.05	1.28	0.16	0.01	5.50
Total	14.93	32.26	33.66	16.39	1.38	0.14	98.77
Calms							1.20
Missing							0.03
Total							100.00

As previously shown, the default AERMOD model is susceptible to overprediction for taller stacks located in elevated terrain. Figure A-2 presents the area surrounding the FutureFuel Chemical site with terrain contours overlaid to indicate the rolling nature of terrain and thus the potential for model overprediction in the areas to the north and southwest of the facility. Given the combination of steep terrain and low wind speed, the ADJ\_U\* option is very applicable to this analysis on a theoretical basis.



Figure A-2. Terrain Surrounding the FutureFuel Chemical Site





### CRITERIA 3.2.2.e.iii - AVAILABILITY OF DATABASES

The test data bases and reporting for low wind speed observations and evaluation are available to assess model performance. The data bases applicable to this discussion and use of the  $u^*$  option in AERMET and AERMOD are:

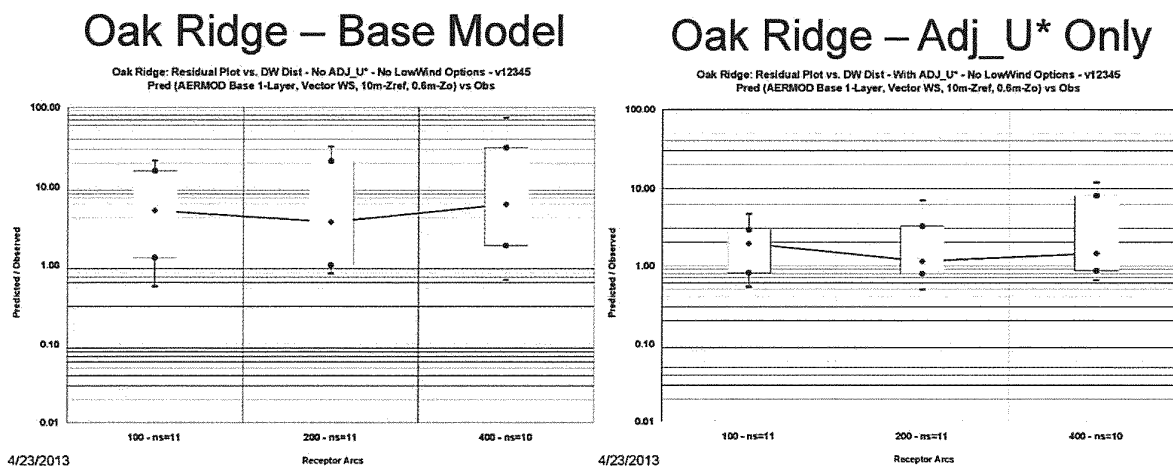
- Idaho Falls Study- Sagendorf JF, Dickson CR (1974) Diffusion under low wind speed, inversion conditions. NOAA Technical Memorandum ERL ARL-52, 89 pp.
- Prairie Grass Study - Barad ML (ed) (1958) Project Prairie Grass. A field program in diffusion. Geophysical research paper no. 59, vols I (300 pp) and II (221 pp). AFCRF-TR-58-235. Air Force Cambridge Research Center, Bedford, Massachusetts; under Model Evaluation Databases on U.S EPA's website - [http://www.epa.gov/ttn/scram/dispersion\\_prefrec.htm](http://www.epa.gov/ttn/scram/dispersion_prefrec.htm)
- Oak Ridge Study - NOAA Technical Memorandum ERL ARL-61, 1976. Diffusion under Low Wind Speed Conditions near Oak Ridge, Tennessee. Wilson, R. B., G. Start, C. Dickson, N. Ricks. Air Resources Laboratory, Idaho Falls, Idaho.

In addition, the AERMET source code and all input data required for implementing the  $ADJ\_U^*$  are publicly available on U.S. EPA's SCRAM website.

### CRITERIA 3.2.2.e.iv - DEMONSTRATION OF NO BIASES TOWARDS UNDERESTIMATES

As demonstrated in a number of studies over the past 3-5 years, including the 2010 study by AECOM<sup>20</sup>, the use of the  $u^*$  adjustment in dispersion modeling has not shown any bias towards underestimating the ambient concentrations due to sources and emissions. A repeat use of the same Oak Ridge data set in 2013 by the U.S. EPA in their model performance evaluation demonstrates both the improved performance of AERMOD with  $u^*$  option and no bias towards underestimation as shown in Figure A-3.

**Figure A-3. Residual Plots Showing Improved Performance with  $u^*$  and No Bias toward Underestimation**



<sup>20</sup> AERMOD Low Wind Speed Evaluation Study Results, AECOM prepared for the American Petroleum Institute, Washington, DC, March 22, 2010.



### CRITERIA 3.2.2.e.v - A PROTOCOL HAS BEEN ESTABLISHED

This document serves as the modeling protocol being submitted to ADEQ by FutureFuel to clearly identify all of the data resources and modeling methodology proposed for use in the SO<sub>2</sub> Attainment analysis. There is discussion regarding the potential frequent occurrence of low winds due to the EPA-recommended use of the one-minute meteorological data available from the National Oceanic and Atmospheric Administration website.

The use of the LOWWIND options (e.g. LOWWIND3, which has been proposed for incorporation into the revised *Guideline*) was also considered to be appropriate for this modeling application. However, FutureFuel is proposing only ADJ\_U\* because it has been subject to extensive peer review and thus the likelihood of the approval of its use for this modeling exercise is greater.



## APPENDIX B: OCTOBER 2016 ADEQ RESPONSE TO EPA COMMENTS

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October 12, 2016

Ashley Mohr  
Environmental Scientist  
Air Permits Section (6MM-AP)  
U.S. EPA Region 6  
1445 Ross Avenue, Suite 1200  
Dallas, Texas 75202—2733

Subject: EPA's Modeling Protocol Feedback for Independence County, Arkansas  
(Entergy Independence Power Plant & FutureFuel Chemical Company Combined SO<sub>2</sub>  
NAAQS Demonstration)

Dear Ms. Mohr:

Thank you for your email, dated September 29, 2016, that provided ADEQ with additional Modeling Protocol and Adjusted\_U\* Request feedback for the EPA's requested SO<sub>2</sub> attainment modeling that simultaneously simulates SO<sub>2</sub> emissions from Entergy's Independence Power Plant (Entergy Independence) and the Futurefuel Chemical Company (FutureFuel), both located in Independence County Arkansas. We have evaluated your comments, along with those provided by Robert Imhoff and Guy Donaldson in a phone conversation and email on July 14, 2016 and a follow-up conference call<sup>1</sup> with the EPA Region 6 and the EPA Model Clearinghouse that occurred on August 18, 2016. In the July 14, 2016 phone call/email and the August 18, 2016 follow-up conference call, EPA provided the Modeling Protocol and Adjusted\_U\* Request feedback that:

*...“to get a MCH concurrence we will need additional information.”...“to establish a firm link between the science on which Adj\_U\* option is based and the individual source/receptor situation of an application.” Specifically including an evaluation of the locations of the receptors where significant change occur (to confirm that it is an elevated terrain issues) and what the change in the actual u\* value was when concentrations were reduced using the beta option (to confirm that the adjustment via the beta option is the reason for the concentration reductions).”*

Also during the August 18, 2016 follow-up conference call, ADEQ asked if, in addition to the necessary Adjusted\_U\* Request sensitivity analysis the EPA had any other comments – no additional comments were provided and ADEQ proceeded.

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<sup>1</sup> Conference Call participants included: Guy Donaldson, George Bridgers and Ashley Mohr from the EPA; Will Montgomery, Mark McCorkle and David Clark from ADEQ; Jay Haney and Sharon Doulgas from ICF Jones and Stokes (representing ADEQ); Philip Antici from FutureFuel; Chuck Buttry and John Becherer from Trinity Environmental; and David Triplett from Entergy Arkansas.



As EPA will recall, Entergy's Independence facility was a 2010 SO<sub>2</sub> NAAQS Data Requirements Rule<sup>2</sup> second-round facility<sup>3</sup> and FutureFuel was a third-round facility<sup>4,5</sup>. Per the DRR Round 2 schedule, on September 11, 2015, Arkansas submitted to the EPA a recommendation of "Attainment" for Independence County and supportive AERMOD modeling files for Entergy Independence; however due to "insufficient information" the EPA designated Independence County as "Unclassifiable"<sup>6</sup> and requested that both Entergy Independence and FutureFuel be modeled together to provide the additional information that the EPA needed to make a final attainment designation – bringing FutureFuel from the third-round DRR schedule and into the second-round to be modeled simultaneously with Entergy Independence.

This EPA request to ADEQ for more information in the form of a combined Entergy Independence and FutureFuel combined modeling demonstration prompted ADEQ to submit an SO<sub>2</sub> Designation AERMOD Modeling Protocol and Model Clearinghouse Adjusted\_U\* Request to the EPA on April 27, 2016 that proposed to model the combined SO<sub>2</sub> emissions from both facilities.

As update to the above July 14, 2016 and August 18, 2016 conversations among the EPA, ADEQ and the involved facilities, FutureFuel's SO<sub>2</sub> emissions have been modeled with the Adjusted\_U\* Beta option toggled on and off, individual receptors have been compared and a draft sensitivity analysis report is circulating among ADEQ, FutureFuel, Entergy Independence and the involved consultants.

With regard to the September 29, 2016 Modeling Protocol and Adjusted\_U\* Request comments email that provided ADEQ with additional Modeling Protocol and Adjusted\_U\* Request feedback (in **Bold**), ADEQ submits the below responses (in *Italics*):

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<sup>2</sup> "Data Requirements Rule for the 2-10 1-Hour Sulfur Dioxide (SO<sub>2</sub>) Primary National Ambient Air Quality standard (NAAQS); Final Rule," 80 *Federal Register* 51052, August 21, 2015.

<sup>3</sup> Janet G. McCabe signed EPA Letter to ADEQ dated March 20, 2015 concurring with ADEQ that Entergy Independence and Entergy White Bluff meet the criteria for an ADEQ recommendation submittal date of September 18, 2015 and an EPA Final Designation date of July 2, 2016.

<sup>4</sup> Stuart Spencer signed ADEQ Letter to EPA dated January 8, 2016 identifying FutureFuel Chemical Company, Flint Creek Power Plant and Plum Point Energy Station as "Round 3" facilities.

<sup>5</sup> Wren Stenger signed EPA Letter to ADEQ dated March 21, 2016 concurring with ADEQ that FutureFuel Chemical Company, Flint Creek Power Plant and Plum Point Energy Station meet the criteria for an ADEQ recommendation submittal date of January 13, 2017 and an EPA Final Designation date of December 31, 2017.

<sup>6</sup> Gina McCarthy signed Letter to Arkansas dated June 30, 2016 establishing Independence County as "Unclassifiable".



## EPA's General Comments

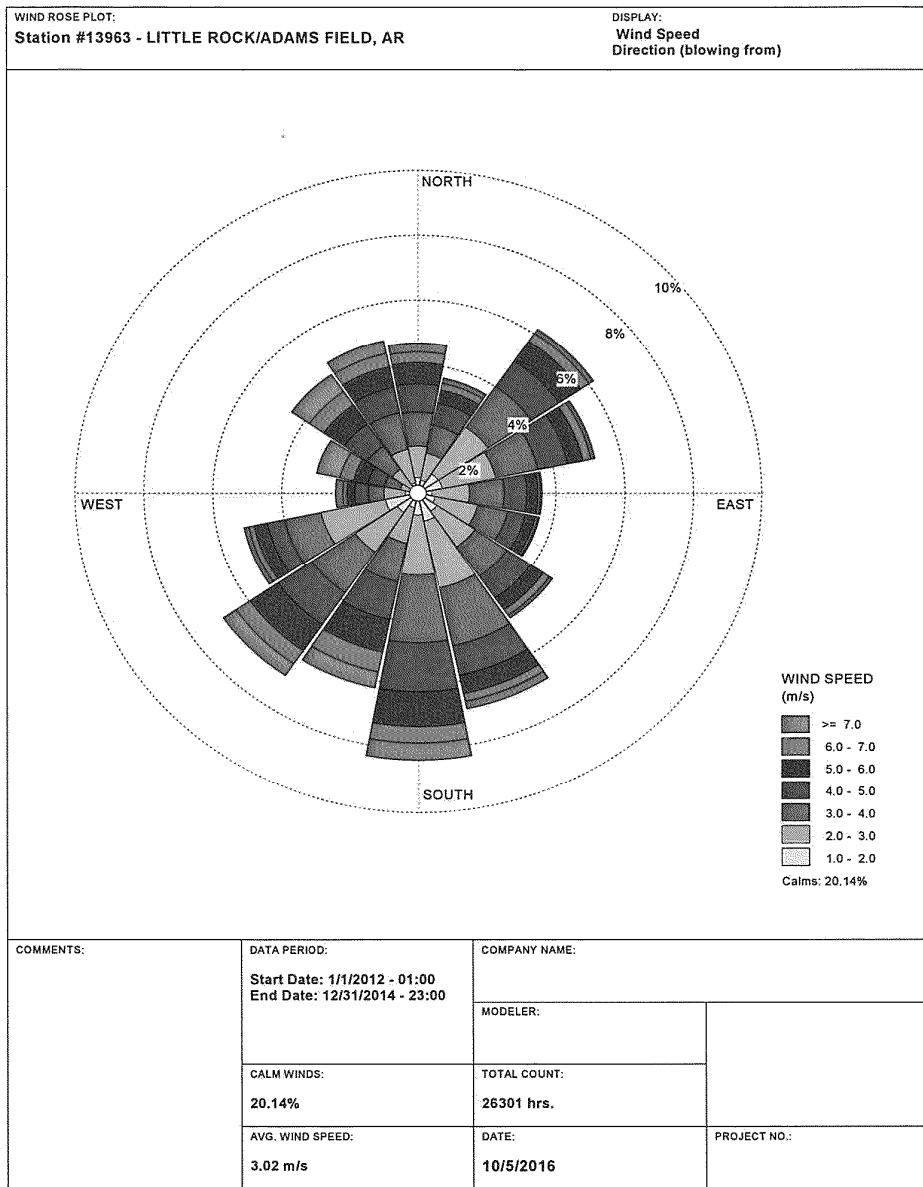
**EPA General Comment 1 – “The protocol indicates that meteorological data, background concentrations, and emissions information for 2012-2014 will be used in the analysis. If available, we suggest conducting the modeling with the latest 3 years of data (2013-2015). If the data period is not updated, we request that information be provided to support that the 2012-2014 data period is representative of the most recent 3 year period.”**

*ADEQ General Response 1 – This project began with gathering and formatting meteorological, background and emissions data prior to the September 11, 2015 Round 2 submission to the EPA of the Entergy Independence (Independence County) attainment recommendation and supportive AERMOD modeling files. Subsequent work included the ADEQ submission on April 27, 2016 that proposed to model Entergy Independence and FutureFuel simultaneously and to request the authorization to employ the Adjusted\_U\* Beta option – the sole EPA response, provided on July 14, 2016 and August 18, 2016, to this ADEQ submittal was that a sensitivity analysis would also be required from ADEQ and ADEQ proceeded acknowledging this comment. For ADEQ and involved facilities to now begin gathering and formatting 2013-2015 data would cause ADEQ to, in effect, be aiming at a moving target within a very limited timeframe. Therefore, here ADEQ addresses the option of “If the data period is not updated, we request that information be provided to support that the 2012-2014 data period is representative of the most recent 3 year period.” with the following information for: 1) meteorological data, 2) background concentrations and 3) emissions information that will also be included in the Attainment Demonstration Modeling Report.*

*1) Meteorological Data: For the Little Rock Airport (the source of Meteorological data inputs), the distribution of wind speed and direction is nearly identical for both three-year periods. There is a slightly greater proportion of southerly winds (from the south) for 2012-2014 (Figure 1) compared with the later overlapping three-year period and a slightly greater proportion of northeasterly winds for 2013-2015 (Figure 2) compared to the prior overlapping three-year period. In both cases, the average wind speed is approximately 3 meters per second (m/s) and winds are calm approximately 20 percent of the time.*



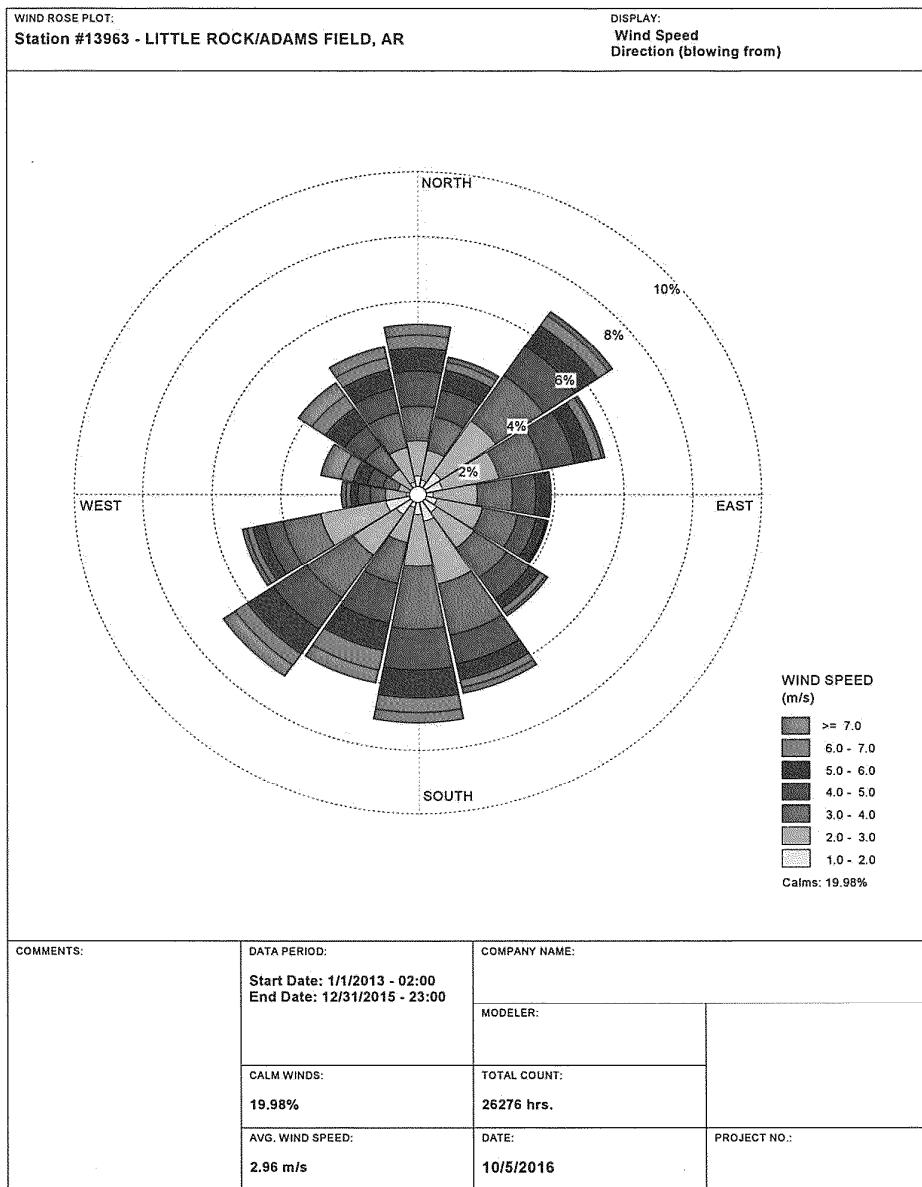
Figure 1: Wind Speed and Wind Direction Frequency for 2012-2014 for the Little Rock Airport / Adams Field



WRPLOT View - Lakes Environmental Software



Figure 2: Wind Speed and Wind Direction Frequency for 2013-2015 for the Little Rock Airport / Adams Field



WRPLOT View - Lakes Environmental Software

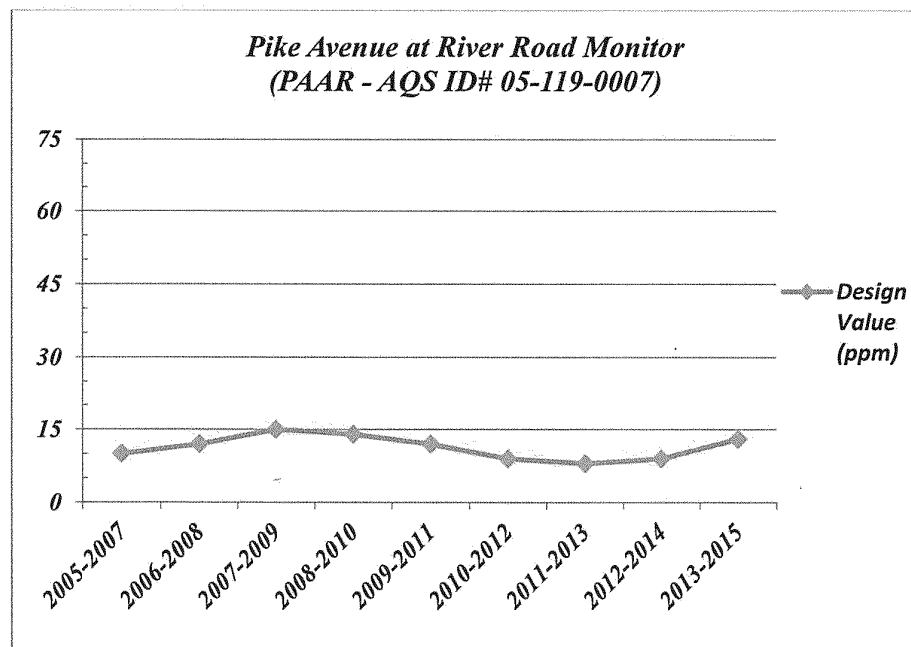


2) *Background Concentrations: The Pike Avenue at River Road Monitor (PAAR - AQS ID# 05-119-0007), which is the monitor from which background concentrations have been generated, indicates very little difference (4 ppm) in Design Values between 2012-2014 and 2013-2015 (Table 1 and Figure 3). Therefore, utilizing data that was generated at the beginning of this project, prior to the initial submission to EPA on September 11, 2015, as opposed to now gathering and formatting updated data should not cause any difference in the modeled outcome.*

*Table 1: Background Concentrations for 2012-2014 and 2013-2015 Design Values for the Pike Avenue at River Road (PARR) Monitor (AQS ID# 05-119-0007)*

<b>PAAR Monitor AQS ID# 05-119-0007</b>	<b>2005- 2007</b>	<b>2006- 2008</b>	<b>2007- 2009</b>	<b>2008- 2010</b>	<b>2009- 2011</b>	<b>2010- 2012</b>	<b>2011- 2013</b>	<b>2012- 2014</b>	<b>2013- 2015</b>
<b>Design Value (ppm)</b>	<b>10</b>	<b>12</b>	<b>15</b>	<b>14</b>	<b>12</b>	<b>9</b>	<b>8</b>	<b>9</b>	<b>13</b>

*Figure 3: Background Concentrations for 2012-2014 and 2013-2015 Design Values for the Pike Avenue at River Road (PARR) Monitor (AQS ID# 05-119-0007)*





3) Emissions Data: Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO<sub>2</sub>) Primary National Ambient Air Quality Standard (NAAQS); Final Rule

*Because emissions data for the current project has been collected, formatted and input into AERMOD, for both the original September 11, 2015 Attainment Designation submission and the current sensitivity analysis, ADEQ proposes that the following provision<sup>7</sup> in the DRR requires annual updates of emissions data:*

*“For areas that were characterized using air quality modeling, the ongoing data requirement applies only where the modeling was based on actual emissions and where the area has not subsequently received a nonattainment designation. In such cases, the air agency will be required to submit an annual report to the EPA providing updated emissions information and recommending to the EPA whether further modeling is warranted to assess any expected changes in recent air quality.”*

**EPA General Comment 2 – “As you are aware, the release of a new version of AERMOD is anticipated in the near future (along with the final revisions to Appendix W). While significant changes in modeled results are not expected to occur from the change in model versions, we suggest either updating the analysis once the new version is released or conducting a sensitivity run for one of the modeled years to confirm the new model version does not affect your determination regarding the SO<sub>2</sub> designation for the area.”**

*ADEQ General Response 2 – Like the EPA, ADEQ does not expect any appreciable change in results from a new version of AERMOD. If a new version of AERMOD is released prior to completion of the current project, ADEQ would evaluate the feasibility of utilizing the new version.*

**EPA General Comment 3 – “The proposed meteorological stations and background monitoring stations are suitable for the modeling conducted for Independence County.”**

*ADEQ General Response 3 – Duly noted.*

**EPA General Comment 4 – “Based on our review of recent EI data, no additional large sources of SO<sub>2</sub> are located nearby. Therefore, the inclusion of the DRR facility sources only is appropriate.”**

*ADEQ General Response 4 – Duly noted.*

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<sup>7</sup> Data Requirements Rule for the 2010 1-Hour Sulfur Dioxide (SO<sub>2</sub>) Primary National Ambient Air Quality Standard (NAAQS); Final Rule (80 FR 51054-51055)



**EPA General Comment 5 – “As part of the final modeling report, we expect to see additional information regarding how the actual emission rates are determined. Specifically, if these are based on emissions monitoring or based on calculations using operational data. If calculated, the final modeling report should include information to support the calculated emission rates, including the underlying operational data and calculations relied upon. If monitored emission rates will be modeled, such as CEMS data, information regarding the presence of mission data should be provided along with an explanation of how missing emissions data will be replaced.”**

*ADEQ General Response 5 – Actual emissions for both Entergy Independence and FutureFuel are used in the current modeling project (except FutureFuel’s Thermal Oxidizer where the permitted allowable emissions are used; also see ADEQ Specific Response 1 below) and are calculated from both facility CEM systems data and operational data. Documentation that includes calculations of actual emissions will be provided in the Final SO<sub>2</sub> Attainment Designation Modeling Report.*

### **EPA’s Specific Questions**

**EPA Specific Question 1 – “The modeling protocol indicates that allowable emission rates will be modeled for all sources except the Thermal Oxidizer located at the Future Fuels facility. Could you provide additional information regarding why allowable emissions will not be modeled for this particular source? Is it a matter of data availability or information required to calculate an actual emission rate?”**

*ADEQ Specific Response 1 – EPA may have misread the SO<sub>2</sub> Designation AERMOD Modeling Protocol and Model Clearinghouse Adjusted\_U\* Request submitted to the EPA on April 27, 2016. Each FutureFuel modeled emission point uses actual 2012-2014 emission rates, except the Thermal Oxidizer (TO), which uses permitted allowable emissions. The TO is permitted for 3.0 pounds per hour (lb/hr) SO<sub>2</sub> and actual emissions are less than 0.02 lb/hr (see ADEQ Specific Response 2 below). Due to considerable time and effort necessary to establish an actual emissions dataset for the TO, ADEQ and FutureFuel had elected to model the worst-case, most conservative allowable emission rate. If EPA desires, ADEQ and FutureFuel can reevaluating the effort required to calculate the actual emissions from FutureFuel’s TO and consider incorporated the TO’s actual emissions into the final model run.*



**EPA Specific Question 2 – “It is unclear if the modeled source parameters (velocity and temperature) will be single constant values or if variable stack parameters will be modeled. Please clarify what type of source parameters will be modeled and what the basis of those parameters is.”**

*ADEQ Specific Response 2 – For FutureFuel sources, the exhaust exit velocity and temperature are modeled as constant values based on recent stack test measured values; FutureFuel does not have continuous monitoring of exhaust conditions on any unit and all the modeled units run at essentially stable conditions. Entergy Independence stack parameters are variable hourly values derived from the facility CEM system. Documentation of the sources of the constant stack parameters will be provided in the Final Attainment Demonstration Modeling Report.*

**EPA Specific Question 3 – “Please provide additional information regarding the five emission sources located at the Future Fuels facility that are excluded from the modeling analysis – including source type and any associated operational limits that exist for those units (e.g., permit limits on hours of operation).”**

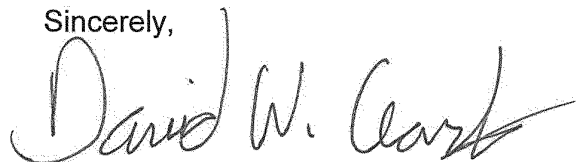
*ADEQ Specific Response 2 – For clarification, our SO<sub>2</sub> Designation AERMOD Modeling Protocol and Model Clearinghouse Adjusted\_U\* Request submitted on April 27, 2016 states: “All SO<sub>2</sub> emitting sources at FutureFuel will be modeled except for five very small SO<sub>2</sub> sources (less than 3.8 lb/hr total) and per EPA’s clarification memorandum, intermittent emergency sources such as an emergency diesel-fired generator and fire water pump engines.<sup>6</sup>”. So the total number of sources not being modeled is 5 very small SO<sub>2</sub> sources plus 5 intermittent emergency sources as shown in Table 2 below. These excluded sources account for 1.5% of the permitted allowable SO<sub>2</sub> emissions and have conservative permitted allowable limits. For example, the TO and Caustic Scrubber (5N09-03) is permitted for 3.0 lb/hr SO<sub>2</sub>, but actual emissions are less than 0.02 lb/hr SO<sub>2</sub>. Likewise, the Isopropyl Benzene unit Flare (5N03-54) is permitted for a worst-case emission rate of 0.5 lb/hr SO<sub>2</sub> when the actual emissions for this unit are less than 0.02 lb/hr SO<sub>2</sub>. If EPA desires, these sources permitted allowable emissions rates can be included in the final SO<sub>2</sub> attainment designation model run.*



Table 2: Model-excluded FutureFuel SO<sub>2</sub> sources

SN	Name	SO <sub>2</sub> (lb/hr)	Justification
5N09-03	Thermal Oxidizer and Caustic Scrubber	3.0 (permit limit) 0.02 (actual emissions)	Only one of two TO/scrubbers (09-02 and 09-03) is actually receiving process gas at any given time
6M06-01	#4 Boiler	0.1 (permit limit)	Natural gas boiler
6M06-02	#5 Boiler	0.2 (permit limit)	Natural gas boiler
5M04-10	Scrubber (NOBS)	0.1 (permit limit)	Source has not operated since 2009 due to ceasing production of product, although equipment remains potentially operable
5N03-54	Flare	0.5 (permit limit) 0.02 (actual emissions)	No sulfur in process. Pilot on natural gas since August 2012.
5N01-WA	Diesel Glycol Pump	These are all emergency RICE and are limited to <100 hr/yr of operation. EPA modeling guidance excludes such intermittent sources in modeling for probabilistic 1-hour standards. <sup>8</sup>	
7M04-HT-G01	Diesel Waste Disposal Pump		
7M04-HT-G04	Diesel Waste Disposal Pump		
6N02	Diesel Generator		
8M01	Diesel Fire Water Pump		

Sincerely,



David W. Clark  
Epidemiologist  
Policy & Planning Branch  
Office of Air Quality  
Arkansas Department of Environmental Quality

cc: Chuck Buttry (Trinity Consultants)  
Jay Haney (ICF Jones and Stokes, Inc.)  
Philip Antici (FutureFuel Chemical Company)  
David Triplett (Entergy Arkansas, Inc.)

<sup>8</sup> [https://www3.epa.gov/ttn/scram/guidance/clarification/Additional\\_Clarifications\\_AppendixW\\_Hourly-N02-NAAQS\\_FINAL\\_03-01-2011.pdf](https://www3.epa.gov/ttn/scram/guidance/clarification/Additional_Clarifications_AppendixW_Hourly-N02-NAAQS_FINAL_03-01-2011.pdf)



## APPENDIX C: EMISSION RATES AND EMISSION CALCULATION DISCUSSION

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A listing of the 2012-2014 actual emission rates and an explanation of the actual emission calculations appear on the following pages.



The EMISFACT option in AERMOD was utilized to supply the varying monthly emission rates for the units with monthly emission rate data.

This option allows for a different emission rate to be used in the model for each month. The EMISFACT is calculated as a fraction of the allowable emission rate. The allowable emission rate is entered into the input file and then is multiplied by each monthly EMISFACT to calculate the actual emission rate for each month.

## 2012 Emissions

	5N09-01 RTO		6M01-01 Coal Boilers		6M03-05 Incinerator		Hot Oil System	
Month	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 8.4 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 1418.7 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 11.6 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 1.1 lb/hr Allowable Rate)
Jan-12	0.1102	0.0131	690.30	0.4866	2.249	0.1938	0.00E+00	0.0E+00
Feb-12	0.0704	0.0084	633.00	0.4462	2.210	0.1905	5.89E-05	5.4E-05
Mar-12	0.0363	0.0043	553.62	0.3902	3.145	0.2711	5.11E-05	4.6E-05
Apr-12	0.1028	0.0122	636.73	0.4488	5.240	0.4517	5.56E-06	5.1E-06
May-12	0.0806	0.0096	615.65	0.4340	5.878	0.5067	4.70E-05	4.3E-05
Jun-12	0.0833	0.0099	440.88	0.3108	2.490	0.2147	5.97E-05	5.4E-05
Jul-12	0.1317	0.0157	426.47	0.3006	1.531	0.1320	3.76E-05	3.4E-05
Aug-12	0.1116	0.0133	472.86	0.3333	1.204	0.1038	6.32E-05	5.7E-05
Sep-12	0.0931	0.0111	475.48	0.3352	1.664	0.1434	6.11E-05	5.6E-05
Oct-12	0.0820	0.0098	446.90	0.3150	0.625	0.0539	6.32E-05	5.7E-05
Nov-12	0.1014	0.0121	674.77	0.4756	1.785	0.1539	5.83E-05	5.3E-05
Dec-12	0.1223	0.0146	657.63	0.4635	2.339	0.2016	5.78E-05	5.3E-05

## 2013 Emissions

	5N09-01 RTO		6M01-01 Coal Boilers		6M03-05 Incinerator		Hot Oil System	
Month	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 8.4 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 1418.7 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 11.6 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 1.1 lb/hr Allowable Rate)
Jan-13	0.0833	0.0099	802.01	0.5653	2.124	0.1831	6.18E-05	5.6E-05
Feb-13	0.1696	0.0202	715.35	0.5042	3.859	0.3326	6.85E-05	6.2E-05
Mar-13	0.1156	0.0138	705.08	0.4970	4.117	0.3549	6.99E-05	6.4E-05
Apr-13	0.1278	0.0152	604.00	0.4257	4.757	0.4101	1.81E-05	1.6E-05
May-13	0.1196	0.0142	620.64	0.4375	3.668	0.3162	5.78E-05	5.3E-05
Jun-13	0.1431	0.0170	532.55	0.3754	6.282	0.5415	7.78E-05	7.1E-05
Jul-13	0.1304	0.0155	567.41	0.4000	5.004	0.4314	7.39E-05	6.7E-05
Aug-13	0.1035	0.0123	542.23	0.3822	5.015	0.4323	6.18E-05	5.6E-05
Sep-13	0.0806	0.0096	573.37	0.4042	5.157	0.4446	4.72E-05	4.3E-05
Oct-13	0.0188	0.0022	586.33	0.4133	4.349	0.3750	2.82E-05	2.6E-05
Nov-13	0.0014	0.0002	453.91	0.3199	4.479	0.3861	4.86E-05	4.4E-05
Dec-13	0.0040	0.0005	555.77	0.3917	4.149	0.3577	6.85E-05	6.2E-05

## 2014 Emissions

	5N09-01 RTO		6M01-01 Coal Boilers		6M03-05 Incinerator		Hot Oil System	
Month	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 8.4 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 1418.7 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 11.6 lb/hr Allowable Rate)	Actual Emission Rate (lb/hr)	EMISFACT (Actual Emission Rate/ 1.1 lb/hr Allowable Rate)
Jan-14	0.0309	0.0037	718.25	0.5063	4.512	0.3890	6.18E-05	5.6E-05
Feb-14	0.0506	0.0060	661.84	0.4665	4.126	0.3557	6.85E-05	6.2E-05
Mar-14	0.0497	0.0059	676.81	0.4771	4.593	0.3959	2.96E-05	2.7E-05
Apr-14	0.0819	0.0098	634.67	0.4474	3.574	0.3081	5.83E-05	5.3E-05
May-14	0.0699	0.0083	806.82	0.5687	0.327	0.0282	7.53E-05	6.8E-05
Jun-14	0.0861	0.0103	787.54	0.5551	2.074	0.1788	5.97E-05	5.4E-05
Jul-14	0.0538	0.0064	637.60	0.4494	1.483	0.1278	6.32E-05	5.7E-05
Aug-14	0.0215	0.0026	700.34	0.4937	3.843	0.3313	7.53E-05	6.8E-05
Sep-14	0.0736	0.0088	724.02	0.5103	4.043	0.3485	7.22E-05	6.6E-05
Oct-14	0.0470	0.0056	629.27	0.4436	4.574	0.3943	7.12E-05	6.5E-05
Nov-14	0.0347	0.0041	687.10	0.4843	4.296	0.3703	5.83E-05	5.3E-05
Dec-14	0.0444	0.0053	705.38	0.4972	4.567	0.3937	5.51E-05	5.0E-05



## FutureFuel Chemical Company

### Sulfur Dioxide Source Calculation Explanations

FutureFuel owns and operates an organic chemical manufacturing facility utilizing both batch and continuous manufacturing processes. Due to the nature of batch manufacturing at the facility, emissions, especially emissions from control devices through which process streams vent directly, will vary as the mixture of products made varies.

During a typical month, employing at least twenty to thirty separate processes, FutureFuel manufactures a varied set of products to meet customer needs. An internal database serves to maintain material balance information for each process and product. Using the quantity of the various products manufactured from monthly production records, engineering calculations, and process knowledge, production related waste stream compositions and volumes are determined from each process material balance. For example, this information may be used to quantify the amount of sulfur entering the solid waste, wastewater, or air.

#### SN 5N09-01 Regenerative Thermal Oxidizers (RTOs)

As part of the monthly inventory, emissions to SN 5N09-01 are calculated using the actual quantity of each product manufactured and the data from each process material balance.

For each sulfur-containing component vented to SN 5N09-01, combustion calculations have been evaluated to determine the amount of SO<sub>2</sub> generated.

The total quantity of SO<sub>2</sub> emitted from all processes venting through SN 5N09-01 is summed and recorded. An example calculation on a per component basis is as follows:

$$\frac{\text{lb Sulfur}}{\text{lb SO}_2} = \left\{ \left( \frac{\text{lb Sulfur}}{\text{lb SO}_2} \right) \left( \frac{\text{lb SO}_2}{32} \right) \left( \frac{\text{lb SO}_2}{2} \right) \right\} \left( \frac{64}{2} \right)$$

#### SN 6M01-01 Coal Fired Boilers

FutureFuel Chemical Company operates three coal-fired boilers, grouped under the umbrella of SN 6M01-01. Coal, liquid chemical waste, and sludge are burned in SN 6M01-01. It is assumed that all sulfur entering SN 6M01-01 through either waste chemicals or sludge will be emitted as SO<sub>2</sub>. It is also assumed that all sulfur contained in the coal burned in SN 6M01-01 will be emitted as SO<sub>2</sub> with the exception of the sulfur retained in the coal ash. An analysis is conducted on each shipment of coal. Guidance for determining the amount of sulfur retained in the coal ash was taken from EPA Publication 600/7-78-153b, November 1973, "Sulfur Retention in Coal Ash."

The total quantity of SO<sub>2</sub> emitted from SN 6M01-01 is calculated as follows:







### SN 5N09-02 Thermal Oxidizer TO-01 and Caustic Scrubber

Process vent streams routed to SN 5N09-02 do not include sulfur containing compounds. Sulfur dioxide emissions from SN 5N09-02 result from natural gas combustion and have been estimated to be approximately 0.5 lb/month using factors from AP-42 *Compilation of Air Pollutant Emission Factors* Table 1.4-2 "Emission Factors for Criteria Pollutants and Greenhouse Gases from Natural Gas Combustion." As a worse-case representation of actual SO<sub>2</sub> emissions, the permit allowable SO<sub>2</sub> emission rate of 3.0 lb/hr for 5N09-02 was modeled.

### SN 5N09-03 Thermal Oxidizer (TO) and Caustic Scrubber

SN 5N09-03 was constructed in 2016 to serve as an on-line spare for SN 5N09-02. Since this unit did not exist during the modeled period, it was not modeled. As with SN 5N09-02, process vent streams do not contain sulfur containing compounds.



## APPENDIX D: 2012-2014 COAL USAGE AND COAL SULFUR CONTENT DATA

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The following pages contain the 2012-2014 coal usage and coal sulfur analysis data for the coal fired boilers (source 6M01-01).



Coal Usage (Tons)	January	February	March	April	May	June	July	August	Sept	October	Nov	Dec	Totals
2012	5,081	4,517	4,012	4,760	4,688	3,382	2,926	3,266	3,139	3,053	4,193	4,058	47,075
2013	4,954	3,840	4,319	3,187	3,657	3,020	3,832	3,845	3,594	3,994	2,959	3,940	45,141
2014	4,656	4,380	4,371	3,920	4,872	5,021	3,763	4,491	4,247	3,759	4,632	6,439	54,551



2012 Coal Analysis Data

First Sample Date	Last Sample Date	Special Analysis Date	Month	Qtr	LAB NAME	% MOISTURE as RECEIVED	% ASH as RECEIVED	BTU / lb. as RECEIVED	% SULFUR as RECEIVED
		3/6/2012	3	1	American Interplex				
		5/14/2012	5	2	American Interplex				
		6/20/2012	6	2	Standard Laboratories, Inc.				
		9/4/2012	9	3	American Interplex				
		11/7/2012	11	4	American Interplex				
			0	xxxx					
			0						
01/03/11	01/06/12		1	1	Standard Laboratories, Inc.	13.73	8.39	11,056	2.79
01/07/12	01/13/12		1	1	Standard Laboratories, Inc.	13.58	8.59	11,057	2.74
01/14/12	01/20/12		1	1	Standard Laboratories, Inc.	13.33	8.29	11,151	2.82
01/21/12	01/27/12		1	1	Standard Laboratories, Inc.	13.73	8.33	11,087	2.76
01/28/12	2/3/2012		2	1	Standard Laboratories, Inc.	13.49	8.28	11,158	2.83
02/04/12	2/10/2012		2	1	Standard Laboratories, Inc.	13.62	8.28	11,124	2.72
02/11/12	2/17/2012		2	1	Standard Laboratories, Inc.	14.04	8.20	11,044	2.65
02/18/12	2/24/2012		2	1	Standard Laboratories, Inc.	13.63	8.52	11,059	2.80
02/25/12	3/2/2012		3	1	Standard Laboratories, Inc.	13.22	8.40	11,135	2.80
03/03/12	3/9/2012		3	1	Standard Laboratories, Inc.	13.38	8.78	11,064	2.88
03/10/12	3/16/2012		3	1	Standard Laboratories, Inc.	13.12	8.76	11,082	2.75
03/17/12	3/23/2012		3	1	Standard Laboratories, Inc.	13.85	8.80	10,989	2.88
03/24/12	3/30/2012		3	1	Standard Laboratories, Inc.	12.93	8.71	11,121	2.95
03/31/12	4/6/2012		4	2	Standard Laboratories, Inc.	12.98	8.37	11,189	2.78
04/07/12	4/13/2012		4	2	Standard Laboratories, Inc.	13.23	8.27	11,140	2.72
04/14/12	4/20/2012		4	2	Standard Laboratories, Inc.	13.76	8.46	11,078	2.66
04/21/12	4/27/2012		4	2	Standard Laboratories, Inc.	13.29	8.28	11,197	2.77
04/28/12	5/4/2012		5	2	Standard Laboratories, Inc.	13.16	8.48	11,150	2.85
05/05/12	5/11/2012		5	2	Standard Laboratories, Inc.	12.94	8.56	11,181	2.97
05/12/12	5/18/2012		5	2	Standard Laboratories, Inc.	13.28	8.57	11,106	2.75
05/19/12	5/25/2012		5	2	Standard Laboratories, Inc.	13.60	8.87	11,011	2.90
05/26/12	6/1/2012		6	2	Standard Laboratories, Inc.	13.52	8.58	11,108	2.64
06/02/12	6/9/2012		6	2	Standard Laboratories, Inc.	13.80	8.63	11,047	2.75
06/10/12	6/15/2012		6	2	Standard Laboratories, Inc.	13.18	8.57	11,094	2.87
06/16/12	6/20/2012	Peabody	6	2	Standard Laboratories, Inc./Pe	13.36	9.02	11,006	3.04
06/21/12	6/22/2012		6	2	Standard Laboratories, Inc.	12.45	8.92	11,195	2.96
06/23/12	6/29/2012		6	2	Standard Laboratories, Inc.	12.58	8.86	11,188	2.88
06/30/12	7/6/2012		7	3	Standard Laboratories, Inc.	12.91	8.73	11,142	2.95



2012 Coal Analysis Data

First Sample Date	Last Sample Date	Special Analysis Date			LAB NAME	% MOISTURE as RECEIVED	% ASH as RECEIVED	BTU / lb. as RECEIVED	% SULFUR as RECEIVED
			Month	Qtr					
07/07/12	7/12/2012		7	3	Standard Laboratories, Inc.	12.56	8.67	11,225	2.86
07/13/12	7/20/2012		7	3	Standard Laboratories, Inc.	13.06	8.49	11,147	2.97
07/21/12	7/29/2012		7	3	Standard Laboratories, Inc.	13.45	8.41	11,116	3.02
07/30/12	8/3/2012		8	3	Standard Laboratories, Inc.	13.57	8.50	11,046	2.90
08/04/12	8/10/2012		8	3	Standard Laboratories, Inc.	12.79	8.50	11,165	2.89
08/11/12	8/17/2012		8	3	Standard Laboratories, Inc.	13.44	8.57	11,081	2.76
08/18/12	8/24/2012		8	3	Standard Laboratories, Inc.	12.96	8.50	11,161	2.85
08/25/12	9/7/2012		9	3	Standard Laboratories, Inc.	13.81	9.04	10,974	2.93
09/08/12	9/14/2012		9	3	Standard Laboratories, Inc.	13.67	8.18	11,080	2.85
09/15/12	9/22/2012		9	3	Standard Laboratories, Inc.	13.50	8.92	11,032	3.00
09/23/12	9/29/2012		9	3	Standard Laboratories, Inc.	13.14	8.55	11,141	3.02
09/30/12	10/5/2012		10	4	Standard Laboratories, Inc.	13.64	8.38	11,105	2.79
10/06/12	10/12/2012		10	4	Standard Laboratories, Inc.	13.08	8.53	11,141	2.90
10/13/12	10/19/2012		10	4	Standard Laboratories, Inc.	13.84	8.73	11,068	2.86
10/20/12	10/28/2012		10	4	Standard Laboratories, Inc.	12.34	9.32	11,202	3.51
10/29/12	11/3/2012		11	4	Standard Laboratories, Inc.	12.54	8.52	11,291	3.38
11/05/12	11/9/2012		11	4	Standard Laboratories, Inc.	12.94	8.67	11,220	3.29
11/12/12	11/16/2012		11	4	Standard Laboratories, Inc.	13.03	9.16	11,101	3.30
11/17/12	11/23/2012		11	4	Standard Laboratories, Inc.	12.64	8.62	11,277	3.26
11/24/12	11/30/2012		11	4	Standard Laboratories, Inc.	13.66	8.41	11,082	2.92
12/01/12	12/7/2012		12	4	Standard Laboratories, Inc.	13.12	8.52	11,177	3.16
12/08/12	12/14/2012		12	4	Standard Laboratories, Inc.	13.34	8.48	11,106	3.05
12/15/12	12/21/2012		12	4	Standard Laboratories, Inc.	12.99	8.50	11,203	3.21
12/22/12	12/31/2012		12	4	Standard Laboratories, Inc.	12.89	9.13	11,161	3.10



2013 Coal Analysis Data

First Sample Date	Last Sample Date	Special Analysis Date	Month	Qtr	LAB NAME	% MOISTURE as RECEIVED	% ASH as RECEIVED	BTU / lb. as RECEIVED	% SULFUR as RECEIVED
		1/14/2013	1		American Interplex Corp. Lab				
		5/6/2013	5		American Interplex Corp. Lab				
		8/30/2013	8		American Interplex Corp. Lab				
		11/13/2013	11		American Interplex Corp. Lab				
			0						
12/31/12	01/06/13		1	1	Standard Laboratories, Inc	13.65	8.79	11,086	3.02
01/07/13	01/11/13		1	1	Standard Laboratories, Inc	13.39	8.80	11,099	3.19
01/12/13	01/18/13		1	1	Standard Laboratories, Inc	12.93	9.24	11,128	3.39
01/19/13	01/25/13		1	1	Standard Laboratories, Inc	13.49	8.98	11,061	3.14
01/26/13	2/1/2013		2	1	Standard Laboratories, Inc	12.64	8.74	11,246	3.31
02/02/13	2/8/2013		2	1	Standard Laboratories, Inc	12.88	8.85	11,134	3.20
02/09/13	2/18/2013		2	1	Standard Laboratories, Inc	13.51	9.35	10,994	3.09
02/19/13	2/22/2013		2	1	Standard Laboratories, Inc	13.30	9.59	11,002	3.30
02/23/13	3/1/2013		3	1	Standard Laboratories, Inc	12.95	9.08	11,122	3.19
03/02/13	3/8/2013		3	1	Standard Laboratories, Inc	13.00	9.02	11,131	3.31
03/09/13	3/15/2013		3	1	Standard Laboratories, Inc	12.91	8.98	11,166	3.37
03/16/13	3/22/2013		3	1	Standard Laboratories, Inc	13.54	9.20	11,063	3.26
03/23/13	3/29/2013		3	1	Standard Laboratories, Inc	13.14	9.34	11,062	3.03
03/30/13	4/5/2013		4	2	Standard Laboratories, Inc	11.90	9.30	11,264	3.29
04/06/13	4/12/2013		4	2	Standard Laboratories, Inc	12.65	9.22	11,208	3.26
04/13/13	4/19/2013		4	2	Standard Laboratories, Inc	12.67	8.87	11,197	3.50
04/20/13	4/26/2013		4	2	Standard Laboratories, Inc	13.28	8.62	11,143	3.08
04/27/13	5/3/2013		5	2	Standard Laboratories, Inc	12.99	8.88	11,185	3.30
05/04/13	5/10/2013		5	2	Standard Laboratories, Inc	13.41	8.58	11,126	3.20
05/11/13	5/17/2013		5	2	Standard Laboratories, Inc	11.86	9.68	11,196	3.20
05/18/13	5/24/2013		5	2	Standard Laboratories, Inc	12.46	9.42	11,149	3.20
05/25/13	5/31/2013		5	2	Standard Laboratories, Inc	13.60	8.38	11,085	2.90
06/01/13	6/14/2013		6	2	Standard Laboratories, Inc	12.40	9.19	11,236	3.14
06/15/13	6/22/2013		6	2	Standard Laboratories, Inc	12.06	9.15	11,270	3.29
06/23/13	6/28/2013		6	2	Standard Laboratories, Inc	13.36	8.57	11,127	2.84
06/29/13	7/5/2013		7	3	Standard Laboratories, Inc	13.18	8.26	11,163	2.93
07/06/13	7/12/2013		7	3	Standard Laboratories, Inc	11.82	8.69	11,377	3.03
07/13/13	7/21/2013		7	3	Standard Laboratories, Inc	12.08	9.03	11,287	3.08
07/22/13	7/26/2013		7	3	Standard Laboratories, Inc	12.59	8.95	11,216	3.16
07/27/13	8/2/2013		8	3	Standard Laboratories, Inc	12.77	8.77	11,216	3.05



2013 Coal Analysis Data

First Sample Date	Last Sample Date	Special Analysis		LAB NAME	% MOISTURE as RECEIVED	% ASH as RECEIVED	BTU / lb. as RECEIVED	% SULFUR as RECEIVED
		Date	Month Qtr					
08/03/13	8/9/2013		8 3	Standard Laboratories, Inc	13.37	8.35	11,131	3.00
08/10/13	8/16/2013		8 3	Standard Laboratories, Inc	12.51	8.92	11,161	3.09
08/17/13	8/23/2013		8 3	Standard Laboratories, Inc	13.58	8.30	11,108	2.83
08/24/13	8/30/2013		8 3	Standard Laboratories, Inc	12.62	8.94	11,186	3.11
08/31/13	9/6/2013		9 3	Standard Laboratories, Inc	13.13	8.90	11,086	3.00
09/07/13	9/13/2013		9 3	Standard Laboratories, Inc	11.90	8.85	11,286	3.12
09/14/13	9/20/2013		9 3	Standard Laboratories, Inc	13.80	8.53	11,064	2.97
09/21/13	9/27/2013		9 3	Standard Laboratories, Inc	11.94	9.32	11,207	3.34
09/28/13	10/4/2013		10 4	Standard Laboratories, Inc	12.95	8.90	11,143	3.39
10/05/13	10/11/2013		10 4	Standard Laboratories, Inc	13.00	8.69	11,164	3.13
10/12/13	10/18/2013		10 4	Standard Laboratories, Inc	12.82	8.91	11,189	3.29
10/19/13	10/25/2013		10 4	Standard Laboratories, Inc	12.48	9.31	11,138	3.22
10/26/13	11/1/2013		11 4	Standard Laboratories, Inc	12.85	9.23	11,131	3.33
11/02/13	11/8/2013		11 4	Standard Laboratories, Inc	13.07	9.07	11,171	3.31
11/09/13	11/15/2013		11 4	Standard Laboratories, Inc	12.43	9.16	11,226	3.36
11/16/13	11/22/2013		11 4	Standard Laboratories, Inc	13.11	8.59	11,173	3.37
11/23/13	11/27/2013		11 4	Standard Laboratories, Inc	12.62	8.93	11,257	3.46
11/28/13	12/6/2013		12 4	Standard Laboratories, Inc	12.65	8.97	11,228	3.30
12/07/13	12/13/2013		12 4	Standard Laboratories, Inc	13.54	8.89	11,123	3.20
12/14/13	12/20/2013		12 4	Standard Laboratories, Inc	12.82	9.42	11,116	3.24
12/21/13	12/27/2013		12 4	Standard Laboratories, Inc	14.22	8.69	11,046	3.21



2014 Coal Analysis Data

First Sample Date	Last Sample Date	Special Analysis Date	Month	Qtr	LAB NAME	% MOISTURE as RECEIVED	% ASH as RECEIVED	BTU / lb. as RECEIVED	% SULFUR as RECEIVED
		2/24/2014	1	1	American Interplex Corp. Lab				
		6/6/2014	6	1	American Interplex Corp. Lab				
		8/21/2014	8	1	American Interplex Corp. Lab				
		11/19/2014	11	0	American Interplex Corp. Lab				
12/31/13	01/03/14		1	1	Standard Laboratories, Inc	13.69	9.18	10,956	2.88
01/04/14	01/10/14		1	1	Standard Laboratories, Inc	13.32	8.61	11,099	2.82
01/11/14	01/17/14		1	1	Standard Laboratories, Inc	13.30	9.12	11,110	3.15
01/18/14	01/24/14		1	1	Standard Laboratories, Inc	12.84	8.95	11,171	3.31
01/25/14	1/31/2014		1	1	Standard Laboratories, Inc	13.20	8.95	11,144	2.99
02/01/14	2/7/2014		2	1	Standard Laboratories, Inc	13.65	8.86	11,099	3.19
02/08/14	2/14/2014		2	1	Standard Laboratories, Inc	13.39	8.99	11,045	2.97
02/15/14	2/21/2014		2	1	Standard Laboratories, Inc	13.63	8.40	11,096	2.93
02/22/14	2/28/2014		2	1	Standard Laboratories, Inc	12.99	8.91	11,154	3.20
03/01/14	3/7/2014		3	1	Standard Laboratories, Inc	12.86	9.30	11,146	3.41
03/08/14	3/14/2014		3	1	Standard Laboratories, Inc	12.82	9.36	11,147	3.30
03/15/14	3/21/2014		3	1	Standard Laboratories, Inc	13.45	9.52	11,000	3.30
03/22/14	3/28/2014		3	1	Standard Laboratories, Inc	12.68	9.47	11,128	3.50
03/29/14	4/4/2014		4	2	Standard Laboratories, Inc	13.11	9.31	11,104	3.10
04/05/14	4/11/2014		4	2	Standard Laboratories, Inc	13.15	9.28	11,079	3.28
04/12/14	4/18/2014		4	2	Standard Laboratories, Inc	13.02	9.35	11,121	3.39
04/19/14	4/25/2014		4	2	Standard Laboratories, Inc	12.48	9.47	11,115	3.18
04/26/14	5/2/2014		5	2	Standard Laboratories, Inc	12.37	9.58	11,128	3.22
05/03/14	5/9/2014		5	2	Standard Laboratories, Inc	12.48	10.48	10,969	3.05
05/10/14	5/16/2014		5	2	Standard Laboratories, Inc	13.33	8.50	11,087	2.96
05/17/14	5/23/2014		5	2	Standard Laboratories, Inc	12.11	9.98	11,112	2.29
05/24/14	5/30/2014		5	2	Standard Laboratories, Inc	13.07	9.13	11,082	3.16
05/31/14	6/6/2014		6	2	Standard Laboratories, Inc	12.56	9.64	11,125	3.28
06/07/14	6/13/2014		6	2	Standard Laboratories, Inc	12.39	9.80	11,116	3.45
06/14/14	6/20/2014		6	2	Standard Laboratories, Inc	12.64	8.99	11,185	3.31
06/21/14	6/27/2014		6	2	Standard Laboratories, Inc	13.28	9.74	10,948	3.30
06/28/14	7/3/2014		7	3	Standard Laboratories, Inc	12.12	9.52	11,157	3.53
07/04/14	7/18/2014		7	3	Standard Laboratories, Inc	13.12	8.94	11,101	3.22
07/19/14	7/25/2014		7	3	Standard Laboratories, Inc	12.38	9.58	11,140	3.34
07/26/14	7/31/2014		7	3	Standard Laboratories, Inc	12.41	9.32	11,120	3.21
08/01/14	8/8/2014		8	3	Standard Laboratories, Inc	12.28	9.68	11,101	3.40



2014 Coal Analysis Data

First Sample Date	Last Sample Date	Special Analysis Date			LAB NAME	% MOISTURE as RECEIVED	% ASH as RECEIVED	BTU / lb. as RECEIVED	% SULFUR as RECEIVED
			Month	Qtr					
08/09/14	8/15/2014		8	3	Standard Laboratories, Inc	12.26	9.56	11,105	3.43
08/16/14	8/22/2014		8	3	Standard Laboratories, Inc	11.84	9.77	11,176	3.41
08/23/14	8/29/2014		8	3	Standard Laboratories, Inc	12.21	9.72	11,181	3.29
08/30/14	9/5/2014		9	3	Standard Laboratories, Inc	11.81	9.73	11,213	3.45
09/06/14	9/12/2014		9	3	Standard Laboratories, Inc	12.08	9.50	11,168	3.25
09/13/14	9/19/2014		9	3	Standard Laboratories, Inc	12.15	9.63	11,141	3.30
09/20/14	9/26/2014		9	3	Standard Laboratories, Inc	11.77	9.78	11,158	3.52
09/27/14	10/3/2014		10	4	Standard Laboratories, Inc	11.94	9.74	11,154	3.28
10/04/14	10/10/2014		10	4	Standard Laboratories, Inc	13.06	9.44	11,029	3.31
10/11/14	10/17/2014		10	4	Standard Laboratories, Inc	13.83	9.48	10,925	3.34
10/18/14	10/24/2014		10	4	Standard Laboratories, Inc	13.27	9.13	11,076	3.24
10/25/14	11/1/2014		11	4	Standard Laboratories, Inc	12.38	9.66	11,171	3.11
11/02/14	11/7/2014		11	4	Standard Laboratories, Inc	13.39	8.33	11,107	2.87
11/08/14	11/14/2014		11	4	Standard Laboratories, Inc	13.86	8.69	11,003	2.91
11/15/14	11/21/2014		11	4	Standard Laboratories, Inc	13.70	9.00	10,976	3.11
11/22/14	11/28/2014		11	4	Standard Laboratories, Inc	13.92	9.44	10,893	3.16
11/29/14	12/5/2014		12	4	Standard Laboratories, Inc	13.91	9.56	10,877	3.13
12/06/14	12/12/2014		12	4	Standard Laboratories, Inc	13.39	10.73	10,851	3.26
12/13/14	12/19/2014		12	4	Standard Laboratories, Inc	13.54	9.58	10,967	2.95
12/20/14	12/26/2014		12	4	Standard Laboratories, Inc	14.21	8.94	10,916	2.94
12/27/14	12/31/2014		12	4	Standard Laboratories, Inc	14.06	8.61	11,024	2.94



## APPENDIX E: ELECTRONIC MODELING FILES

---

The files contained on the enclosed CD are listed below.

### **Input files**

SN112S.AMI AERMOD input file for 2012  
SN113S.AMI AERMOD input file for 2013  
SN114S.AMI AERMOD input file for 2014

### **Entergy hourly emission rate files**

2012 Entergy Hourly Emission Rates.hrl  
2013 Entergy Hourly Emission Rates.hrl  
2014 Entergy Hourly Emission Rates.hrl

### **Output files**

SN112S.AML – AERMOD output file for 2012  
SN113S.AML – AERMOD output file for 2013  
SN114S.AML – AERMOD output file for 2014  
2012-SO<sub>2</sub>\_all\_1-hr\_4<sup>th</sup>\_high.plt – ASCII plot file with 2012 H4H 1-hr results  
2013-SO<sub>2</sub>\_all\_1-hr\_4<sup>th</sup>\_high.plt – ASCII plot file with 2013 H4H 1-hr results  
2014-SO<sub>2</sub>\_all\_1-hr\_4<sup>th</sup>\_high.plt – ASCII plot file with 2014 H4H 1-hr results

### **Meteorological data files**

LIT\_APT\_DFLT12.PFL – 2012 Little Rock profile data  
LIT\_APT\_DFLT12.SFC – 2012 Little Rock surface data

LIT\_APT\_DFLT13.PFL – 2013 Little Rock profile data  
LIT\_APT\_DFLT13.SFC – 2013 Little Rock surface data

LIT\_APT\_DFLT14.PFL – 2012 Little Rock profile data  
LIT\_APT\_DFLT14.SFC – 2012 Little Rock surface data



**To:** Donaldson, Guy[Donaldson.Guy@epa.gov]; Spencer, Stuart[SPENCER@adeq.state.ar.us]  
**Cc:** Stenger, Wren[stenger.wren@epa.gov]; keogh@adeq.state.ar.us[keogh@adeq.state.ar.us];  
Montgomery, William[Montgomery@adeq.state.ar.us]; McCorkle, Mark[MAC@adeq.state.ar.us];  
Coleman, Sam[Coleman.Sam@epa.gov]; Gray, David[gray.david@epa.gov]  
**From:** Clark, David  
**Sent:** Tue 1/17/2017 2:06:58 PM  
**Subject:** RE: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of  
Arkansas (Independence County Report)  
[Independence County SO2 Modeling Analysis v8.1 FINAL \(v15181\)-Report only.pdf](#)

Guy,

Due to its size, we had trouble getting the whole report as one file to go through and thought it did that time. Here it is again with the body of the report as one file and I'll try to send the appendices in a separate email next.

David

David W. Clark, M.S.  
Epidemiologist  
Air Division – Planning & Air Quality Analysis Branch  
Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR. 72118  
U.S.A.  
Voice: 501 682-0070  
Fax: 501 682-0753

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-----Original Message-----

From: Donaldson, Guy [mailto:Donaldson.Guy@epa.gov]  
Sent: Friday, January 13, 2017 4:35 PM  
To: Spencer, Stuart  
Cc: Stenger, Wren; Keogh, Becky; Montgomery, William; McCorkle, Mark; Coleman, Sam; Gray, David; Clark, David  
Subject: RE: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas (Independence County Report)

Stuart,

I don't see anything attached.

-----Original Message-----

From: Spencer, Stuart [mailto:SPENCER@adeq.state.ar.us]  
Sent: Friday, January 13, 2017 2:15 PM  
To: Donaldson, Guy <Donaldson.Guy@epa.gov>  
Cc: Stenger, Wren <stenger.wren@epa.gov>; keogh@adeq.state.ar.us; Montgomery, William <Montgomery@adeq.state.ar.us>; McCorkle, Mark <MAC@adeq.state.ar.us>; Coleman, Sam <Coleman.Sam@epa.gov>; Gray, David <gray.david@epa.gov>; Clark, David <CLARKD@adeq.state.ar.us>  
Subject: SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of Arkansas (Independence County Report)



Importance: High

Guy,

Please find attached the Independence County modeling report (Entergy Independence facility and FutureFuel Chemical Company).

If you have any questions, please don't hesitate to contact me.

Sincerely,

Stuart Spencer

Associate Director- Office of Air Quality Arkansas Department of Environmental Quality

5301 Northshore Drive

North Little Rock, AR 72118

Ph. # (501) 682-0750

Fax # (501) 682-0880

E-mail: [SPENCER@adeq.state.ar.us](mailto:SPENCER@adeq.state.ar.us)

Web: <http://www.adeq.state.ar.us>

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**To:** Donaldson, Guy[Donaldson.Guy@epa.gov]  
**Cc:** Stenger, Wren[stenger.wren@epa.gov]; keogh@adeq.state.ar.us[keogh@adeq.state.ar.us];  
Montgomery, William[Montgomery@adeq.state.ar.us]; McCorkle, Mark[MAC@adeq.state.ar.us];  
Coleman, Sam[Coleman.Sam@epa.gov]; Gray, David[gray.david@epa.gov]; Clark,  
David[CLARKD@adeq.state.ar.us]  
**From:** Spencer, Stuart  
**Sent:** Fri 1/13/2017 8:12:18 PM  
**Subject:** SO2 NAAQS Area Attainment Designation Recommendation for Counties in the State of  
Arkansas  
[doc00955820170113133726.pdf](#)  
[removed.txt](#)  
[removed.txt](#)

Guy,

I am pleased to attach for your review and consideration ADEQ's letter recommending an "unclassifiable/attainment" designation for Benton, Independence, and Mississippi Counties, as well as the accompanying modeling reports for the facilities in each of those counties with SO2 emissions greater than the EPA-determined threshold for review. I am attaching the reports for Plum Point and Flint Creek to this e-mail. I will send the Independence County report (Entergy Independence facility and FutureFuel Chemical Company) separately due to its size. An official Governor's letter will follow.

I appreciate our call on this issue earlier this week. Thank you, again, for your guidance and assistance.

Sincerely,

Stuart Spencer  
Associate Director- Office of Air Quality Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, AR 72118  
Ph. # (501) 682-0750  
Fax # (501) 682-0880  
E-mail: SPENCER@adeq.state.ar.us  
Web: <http://www.adeq.state.ar.us>

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January 13, 2017

Mr. Ron Curry  
Regional Administrator  
U.S. Environmental Protection Agency, Region VI  
1445 Ross Avenue, Suite 1200  
Dallas, Texas 75202-2733

Re: Submissions of Sulfur Dioxide (SO<sub>2</sub>) National Ambient Air Quality Standard (NAAQS) Area Attainment Designation Recommendation for Counties in the State of Arkansas.

Dear Mr. Curry:

On June 2, 2010, the federal Environmental Protection Agency (EPA) promulgated a new primary 1-hour NAAQS for SO<sub>2</sub> at 75 ppb for the 3-year average of the 99<sup>th</sup> percentiles of the maximum daily values per calendar year.

As reflected in the State's letter dated March 22, 2011, all monitored counties in Arkansas are then and now attaining the existing primary and secondary SO<sub>2</sub> standards. However, as part of the implementation of the new 1-hour SO<sub>2</sub> NAAQS, EPA has begun requiring, in addition to monitoring data, the use of dispersion modeling for areas with facilities emitting SO<sub>2</sub> in quantities greater than the threshold set by the EPA.

For Round 3, the current round of designations, two counties in Arkansas (Benton and Mississippi) are subject to this requirement because they include facilities with SO<sub>2</sub> emissions greater than the EPA-determined threshold for review. Benton and Mississippi counties are in compliance with the 2010 SO<sub>2</sub> NAAQS based on modeling analyses conducted by or for the Arkansas Department of Environmental Quality (ADEQ). Copies of the two Modeling Reports as well as two complete archives of AERMOD-associated modeling files are enclosed. As a result, Arkansas recommends that the two counties (Benton and Mississippi) be designated "unclassifiable/attainment".

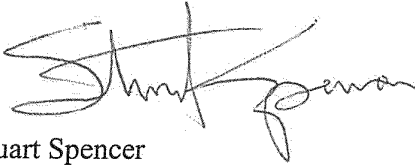
Based on a Round 2 follow-up modeling demonstration involving both Entergy Arkansas Inc.'s Independence Steam Electrical Station and FutureFuel Chemical Company resulting from EPA's June 30, 2016 designation of Independence County as "Unclassifiable" based on "insufficient information", Arkansas also recommends that Independence County be designated "unclassifiable/attainment". A copy of the combined simulation Modeling Report and a complete archive of AERMOD-associated modeling files are enclosed.



In addition, the two counties with existing monitor sites, Pulaski and Union, continue to maintain the standard and should be designated as in "attainment". Jefferson County was already designated as "unclassifiable/attainment" by the EPA in Round 2. All other counties in Arkansas should be designated "unclassifiable."

Per Section 107(d)(1) of the Federal Clean Air Act that requires state governors to recommend attainment status designations after the promulgation of any new or revised NAAQS, a Governor's Letter will follow as soon as possible. For further information regarding these recommendations, please me by phone at 501-682-0750 or email at [SPENCER@adeq.state.ar.us](mailto:SPENCER@adeq.state.ar.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Stuart Spencer", written over a light blue horizontal line.

Stuart Spencer  
Associate Director  
Office of Air Quality  
Arkansas Department of Environmental Quality

attachment: Table of Arkansas County Designation Recommendations

enclosures:

- 1) SO<sub>2</sub> Air Dispersion Modeling Report and a complete archive of AERMOD-associated modeling files for Southwestern Electric Power Company d/b/a Flint Creek Power Plant
- 2) SO<sub>2</sub> Air Dispersion Modeling Report and a complete archive of AERMOD-associated modeling files for Plum Point Services Company, LLC
- 3) SO<sub>2</sub> Air Dispersion Modeling Report and a complete archive of AERMOD-associated modeling files for a combined simulation for Entergy Arkansas Inc.'s Independence Steam Electric Station and FutureFuel Chemical Company



Arkansas 1-Hour Sulfur Dioxide (SO <sub>2</sub> ) Designation Recommendations	
County	Recommended Designation
Arkansas	Unclassifiable
Ashley	Unclassifiable
Baxter	Unclassifiable
Benton	Unclassifiable/Attainment <sup>1</sup>
Boone	Unclassifiable
Bradley	Unclassifiable
Calhoun	Unclassifiable
Carroll	Unclassifiable
Chicot	Unclassifiable
Clark	Unclassifiable
Clay	Unclassifiable
Cleburne	Unclassifiable
Cleveland	Unclassifiable
Columbia	Unclassifiable
Conway	Unclassifiable
Craighead	Unclassifiable
Crawford	Unclassifiable
Crittenden	Unclassifiable
Cross	Unclassifiable
Dallas	Unclassifiable
Desha	Unclassifiable
Drew	Unclassifiable
Faulkner	Unclassifiable
Franklin	Unclassifiable
Fulton	Unclassifiable
Garland	Unclassifiable
Grant	Unclassifiable
Greene	Unclassifiable
Hempstead	Unclassifiable
Hot Spring	Unclassifiable
Howard	Unclassifiable

<sup>1</sup> Current Round 3 recommendation based on enclosed Southwestern Electric Power Company d/b/a Flint Creek Power Plant Modeling Report



Arkansas 1-Hour Sulfur Dioxide (SO <sub>2</sub> ) Designation Recommendations (cont.)	
County	Recommended Designation
Independence	Unclassifiable/Attainment <sup>2</sup>
Izard	Unclassifiable
Jackson	Unclassifiable
Jefferson	Unclassifiable/Attainment <sup>3</sup>
Johnson	Unclassifiable
Lafayette	Unclassifiable
Lawrence	Unclassifiable
Lee	Unclassifiable
Lincoln	Unclassifiable
Little River	Unclassifiable
Logan	Unclassifiable
Lonoke	Unclassifiable
Madison	Unclassifiable
Marion	Unclassifiable
Miller	Unclassifiable
Mississippi	Unclassifiable/Attainment <sup>4</sup>
Monroe	Unclassifiable
Montgomery	Unclassifiable
Nevada	Unclassifiable
Newton	Unclassifiable
Ouachita	Unclassifiable
Perry	Unclassifiable
Phillips	Unclassifiable
Pike	Unclassifiable
Poinsett	Unclassifiable
Polk	Unclassifiable
Pope	Unclassifiable
Prairie	Unclassifiable

<sup>2</sup> Arkansas' recommended change to EPA's Round 2 June 30, 2016 designation

<sup>3</sup> Round 2 recommendation and EPA's June 30, 2016 designation

<sup>4</sup> Current Round 3 recommendation based on enclosed Plum Point Services Company, LLC Modeling Report



Arkansas 1-Hour Sulfur Dioxide (SO <sub>2</sub> ) Designation Recommendations (cont.)	
County	Recommended Designation
Pulaski	Attainment <sup>5</sup>
Randolph	Unclassifiable
St. Francis	Unclassifiable
Saline	Unclassifiable
Scott	Unclassifiable
Searcy	Unclassifiable
Sebastian	Unclassifiable
Sevier	Unclassifiable
Sharp	Unclassifiable
Stone	Unclassifiable
Union	Attainment <sup>5</sup>
Van Buren	Unclassifiable
Washington	Unclassifiable
White	Unclassifiable
Woodruff	Unclassifiable
Yell	Unclassifiable

---

<sup>5</sup> Based on monitor data



**To:** Vivian Aucoin[Vivian.Aucoin@LA.GOV]; Snyder, Erik[snyder.erik@epa.gov]; Feldman, Michael[Feldman.Michael@epa.gov]  
**Cc:** Donald Trahan[Donald.Trahan@LA.GOV]; Donaldson, Guy[Donaldson.Guy@epa.gov]  
**From:** Imhoff, Robert  
**Sent:** Thur 1/5/2017 2:29:41 PM  
**Subject:** RE: Answers to EPA questions and a copy of the modeling report

Vivian,

Thank you for following up on this and confirming that the current 2016 DRR modeling emissions are correct. It's critical to the accuracy of the modeling that the modeling emissions are correct because of the large difference between the stack parameters for the kiln vs the waste heat boiler. We have seen a similar source where a much smaller difference in stack parameters made the difference between modeled attainment and nonattainment.

Best regards,

Bob

**From:** Vivian Aucoin [mailto:Vivian.Aucoin@LA.GOV]  
**Sent:** Thursday, January 05, 2017 8:00 AM  
**To:** Imhoff, Robert <imhoff.robert@epa.gov>; Snyder, Erik <snyder.erik@epa.gov>; Feldman, Michael <Feldman.Michael@epa.gov>  
**Cc:** Donald Trahan <Donald.Trahan@LA.GOV>; Donaldson, Guy <Donaldson.Guy@epa.gov>  
**Subject:** FW: Answers to EPA questions and a copy of the modeling report

Bob, here is the answer to your question. Please let me know if you have any further concerns.

Vivian H. Aucoin

Environmental Scientist, Senior

Air Permits Division, State Implementation Plan

225-219-3482

[vivian.aucoin@la.gov](mailto:vivian.aucoin@la.gov)



**From:** Mindi Faubion, PE [<mailto:mindifaubion@providenceeng.com>]  
**Sent:** Thursday, January 05, 2017 7:41 AM  
**To:** Vivian Aucoin  
**Cc:** Vennetta Hayes; Donald Trahan  
**Subject:** RE: Answers to EPA questions and a copy of the modeling report

Vivian –

I took a look back at the sets of data used in the two modeling efforts. The data used in the 2016 DRR modeling is correct. For the 2015 CD modeling, we used the information that was provided by Rain, which was strictly a total tpy number for 2013 and total hours of operation number for the kiln and the WHB stack. For the 2016 DRR modeling, we pulled the operating data (hourly emission rates) directly from the CEMS.

## **Mindi Faubion, PE**

Managing Engineer – Air Quality

[mindifaubion@providenceeng.com](mailto:mindifaubion@providenceeng.com)

Main: 225-766-7400

Fax: 225-766-7440

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1201 Main Street, Baton Rouge, LA 70802

Providence Engineering and Environmental Group LLC





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**From:** Vivian Aucoin [<mailto:Vivian.Aucoin@LA.GOV>]  
**Sent:** Wednesday, January 04, 2017 6:15 PM  
**To:** Mindi Faubion, PE <[mindifaubion@providenceeng.com](mailto:mindifaubion@providenceeng.com)>  
**Cc:** Vennetta Hayes <[Vennetta.Hayes@LA.GOV](mailto:Vennetta.Hayes@LA.GOV)>; Donald Trahan <[Donald.Trahan@LA.GOV](mailto:Donald.Trahan@LA.GOV)>  
**Subject:** Fwd: Answers to EPA questions and a copy of the modeling report

FYI

Sent from my iPhone

Begin forwarded message:

**From:** "Imhoff, Robert" <[imhoff.robert@epa.gov](mailto:imhoff.robert@epa.gov)>  
**Date:** January 4, 2017 at 4:30:17 PM CST  
**To:** Vivian Aucoin <[Vivian.Aucoin@LA.GOV](mailto:Vivian.Aucoin@LA.GOV)>, "Snyder, Erik" <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>, "Feldman, Michael" <[Feldman.Michael@epa.gov](mailto:Feldman.Michael@epa.gov)>  
**Subject:** RE: Answers to EPA questions and a copy of the modeling report

Vivian,

I think there is a problem with swapping the emission rate for the WHB and the kiln either



in the 2015 CD modeling or in the 2016 DRR modeling. The reason is that if you look at the ratio WHB / kiln emissions, the ratio for the 2015 CD modeling was ~2 while the ratio for the 2016 DRR modeling was ~0.5. This does not make any sense if as Providence says: The ratio of 2013 operating hours for the WHB to kiln is essentially the same as in the 2016 DRR modeling as the ratio in the 2015 CD modeling. Both 2015 and 2016 modeling can't be right. I just don't know which modeling run's emissions are correct.

Best regards,

Bob

**From:** Vivian Aucoin [<mailto:Vivian.Aucoin@LA.GOV>]  
**Sent:** Wednesday, January 04, 2017 3:54 PM  
**To:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>; Feldman, Michael <[Feldman.Michael@epa.gov](mailto:Feldman.Michael@epa.gov)>; Imhoff, Robert <[imhoff.robert@epa.gov](mailto:imhoff.robert@epa.gov)>  
**Subject:** FW: Answers to EPA questions and a copy of the modeling report

Erik, Mike;

Thanks for taking the time to discuss RH with us this morning. As promised, here is the information from Providence on your questions.

Vivian H. Aucoin

Environmental Scientist, Senior

Air Permits Division, State Implementation Plan

225-219-3482

[vivian.aucoin@la.gov](mailto:vivian.aucoin@la.gov)



**From:** Mindi Faubion, PE [<mailto:mindifaubion@providenceeng.com>]  
**Sent:** Thursday, December 15, 2016 11:54 AM  
**To:** Vivian Aucoin; Vennetta Hayes  
**Cc:** Kyle Beall; Kevin Calhoun, PE  
**Subject:** RE:

Vivian / Vennetta –

The attainment modeling report for Calcasieu is attached along with our responses to Erik's questions (in red below). Let us know if you would like us to add any additional information/explanation to this response and/or if you have any questions on the report. The associated model files have been sent via Dropbox.

Thanks,

**Mindi Faubion, PE**

Managing Engineer – Air Quality

[mindifaubion@providenceeng.com](mailto:mindifaubion@providenceeng.com)

Main: 225-766-7400

Fax: 225-766-7440

[www.providenceeng.com](http://www.providenceeng.com)

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**From:** Snyder, Erik [<mailto:snyder.erik@epa.gov>]  
**Sent:** Wednesday, December 14, 2016 2:20 PM  
**To:** Vivian Aucoin <[Vivian.Aucoin@LA.gov](mailto:Vivian.Aucoin@LA.gov)>; [vennetta.hayes@la.gov](mailto:vennetta.hayes@la.gov); Kyle Beall <[kyle@bealllaw.net](mailto:kyle@bealllaw.net)>; Kevin Calhoun, PE <[kevincalhoun@providenceeng.com](mailto:kevincalhoun@providenceeng.com)>; Mindi Faubion, PE <[mindifaubion@providenceeng.com](mailto:mindifaubion@providenceeng.com)>  
**Cc:** Donaldson, Guy <[Donaldson.Guy@epa.gov](mailto:Donaldson.Guy@epa.gov)>; Imhoff, Robert <[imhoff.robert@epa.gov](mailto:imhoff.robert@epa.gov)>; Olszewski, Joshua <[olszewski.joshua@epa.gov](mailto:olszewski.joshua@epa.gov)>  
**Subject:**

Hi,

We downloaded the latest modeling for monitor siting near Reynolds on Monday. Since this has correct stack parameters for the other sources, etc. We wanted to look at it both from the context of Reynolds and also from the context of the additional modeling for the other facilities that you will be providing soon. We also wanted to reiterate issues that we have previously raised but have not received clarification on how they were addressed in context of trying to model some of the area instead of monitoring. Many of these issues were raised in our proposal (Jan/Feb 2016) and in our final action and conversations/writing



this summer. This is not an exhaustive review, but highlights some things that need to be addressed mainly in the context of modeling for the other three DRR sources in the context of demonstrating attainment.

1. Receptors near roadway right-of-way. We have previously noted dating back several months ago that it there seems to be some areas that should have receptors in the modeling but which are omitted. For example there is a John Stine Road that bisects the area excluded around the Entergy sources where there is room in the right-of-way that should include receptors. Roadway and fenceline receptors were added into the model where there was room / it was feasible (*i.e.* not on facility property).
2. Receptors in facilities. We also do not have any documentation of the fenced and access-excluded areas of the facilities to treat the area as non-ambient air. We will need information supporting the areas that have been excluded. From the images provided in the November 2016 report it appears there may be some areas that will need receptors. For example it is not clear but it appears that some of the area south of John Stine Rd. is not access limited by Entergy and the public or other entities have access. See the excerpt of the Modeling TAD (August 2016) at the end of this email about receptor placement. Also see email attached from discussion between Bob Paine and James Thurman about receptors over other facilities. We have brought this issue up in the past but for example Sasol's facility is ambient air to Entergy so there should be a separate model analysis for receptors on Sasol's property using all cumulative emissions except for Sasol's emissions. Similar analysis is needed for each facility to show attainment. This is akin to a PSD permit analysis for demonstrating a new source would not cause or contribute to ambient air that they do not control. Per section 2.0 of the Modeling TAD (August 2016), receptors were placed "only in areas where it is feasible to place a monitor (designations) vs. all ambient air locations (NSR, PSD, and SIP)". Where it would not be feasible to place a monitor inside of a fenceline of another facility, no receptors were placed within facility fencelines. The receptor placement for this analysis followed the same procedures for receptor placement used in all other modeling analyses.
3. Existing Sasol emissions were included in the 2015 modeling of the area but are missing in the most recent modeling (Nov/Dec 2016). These should be included. Modeled emission sources included all facilities with potential facility-wide emissions <80 tpy and therefore were not included. Sasol's potential emissions are <80 tpy.
4. We previously raised concerns with the proposed background monitor value



proposed (see our TSD for proposed designation) and have not seen an updated value proposed, so we will review what is provided. This is addressed in the report- Per EPA and LDEQ discussions on June 15, 2016, Shreveport Seasonal Hour of Day Background 2012-2014 was used.

5. We also previously provided comments on the cumulative 2015 modeling. We also provided comments in a document we sent September 1<sup>st</sup>: “We have not seen any modeling or an updated protocol so this assumes our comments on the protocol have been adequately addressed and all the modeling follows the DRR, monitoring TAD & Appendix W procedures for modeling for monitor placement with the exception that the Cartesian grid can follow a common master grid for multiple sources. The discussion below assumes that the modeling has all the contributing sources in the modeling and that the modeling addressed all of our comments on the protocol. We had commented about including fenceline receptors and clarification on when downwash was or was not included and justifications. If the initial, already-competed modeling did not include the fenceline receptors, they should be included in the second phase of the modeling (frequency analysis) in addition to the maximum receptors identified.” Please check to make sure these have been adequately addressed. This is addressed in the report. Fenceline receptors were included as well as downwash data for all facilities included in the model.
6. Examining the normalized modeling for the Reynolds monitor placement we assume that, other than the normalization of emissions, the other modeling parameters would be the same. We normalized the SO<sub>2</sub> emissions for both the 2015 CD modeling and for the current DRR modeling (revised parameters) to the Reynolds Calciner Kiln emission rate. By normalizing both sets to the same source we now have relative emission rates for all Calcasieu sources to the Reynolds Calciner Kiln. Thus we can compare the emission rates between the two modeling sets. The ratio in the last column of the table below is the 2015 CD modeling normalized rate / the 2016 DRR modeling normalized rate (both for the 2013 year). Any ratio much greater than one would indicate a relative shortfall for some reason between what had previously been used in the CD modeling and what is in the current modeling (and visa versa). Most of the sources are within 5% plus or minus; Citco has a few sources that are higher in the 2016 modeling (please verify correct values). The big exception seems to be for Rain where it seems that the emissions from the WHB and Kiln have been reversed from the 2015 CD to the 2016 DRR modeling.

Also, we note the following:

1. The emissions in the DRR modeling files from the Rain WHB are zero for all of 2012



2. The buoyancy flux for the kiln are about 10X that for the WHB, thus creating greater plume rise in the model for emissions from the kiln.

Prior to submittal of any proposed modeling intended to demonstrate attainment in the remainder of the parish:

- Can you verify that the WHB emissions were zero for all of 2012? This is correct. The WHB was not brought online until December 2012.
- Can you verify that the proper ratio of WHB to kiln emissions for 2013 are approximately 0.5 as are represented in the DRR modeling files? This is also correct. The ratio of 2013 operating hours for the WHB to kiln is essentially the same as in the 2016 DRR modeling as the ratio in the 2015 CD modeling.

Compare 2015 & 2016 version of emissions						
YR	Source ID	Company	Source Description	2015 nSO2	2016 nSO2	Ratio
2013	1	Reynolds	Calciner Kiln and Cooler - Normal Operating Scenario	1.00E+00	0.0000056059925	0.99996814345
2013	2	Reynolds	Anode Baking Furnace - Normal Operating Scenario	7.31E02	7.15902705357275E02	0.978159505521
2013	6	Citgo	Power House Boiler B1C	1.09E02	1.03157801748604E02	0.95613910649
2013	7	Citgo	Power House Boiler B1B	9.57E03	9.40913161920811E03	0.981746253125
2013	8	Citgo	Power House Boiler B1, B1A	1.91E02	1.87970420637308E02	0.9841346434516
2013	9	Citgo	Power House Boiler B2	2.72E03	2.63937954396965E03	0.9702966551607
2013	10	Citgo	Power House Boiler B2A	3.07E03	2.98180054158111E03	0.972866783982
2013	22	Citgo	Power House Boiler B3A, B3C	2.21E03	2.1367083047771E03	0.96703213199044
2013	23	Citgo	Power House Boiler B5A	3.72E03	3.41596411486114E03	0.918845342895
2013	26	Citgo	3(VIII-A)1 - DC/DA Stack B-602 (Acid Plant, AAT Area)	2.98E02	2.90192587016502E02	0.97372743160108
2013	30	Citgo	3(IX)41 - B-5 Flare	1.39E01	0.13538351112665E01	0.09702940568381



			01		
20131	Citgo	3(IX)42 - B-6 Flare	1.13E02	1.09902464265332E02	1E2933678359
20132	Citgo	3(IX)33 - B-7 Flare	5.76E04	5.58979567731136E04	1E3058757406
20133	Citgo	3(VI)6 - B-8 Flare	9.80E02	9.52130794443354E02	1E2939967572
20134	Citgo	3(IV)2 - B-9 Flare	4.31E04	4.19312357766818E04	1E2777477259
20136	Citgo	3(XXIII)2 - B-12 Flare	8.18E04	7.93923477284525E04	1E3025288445
20138	Citgo	A-Topper Furnace B-4	7.82E03	7.72232737288536E03	1E1306492454
20139	Citgo	Topper Furnace B-104	9.66E03	9.56204314925254E03	1E0992977480
20143	Citgo	A Cat Feed Preheat Furnace, B-6	5.32E04	5.13088261258595E04	1E3705748707
20144	Citgo	B Cat Feed Preheat Furnace, B-6	6.44E04	6.16430769205745E04	1E4511205185
20145	Citgo	C Cat Feed Preheat Furnace, B-6	6.22E04	5.61621345737825E04	1E0795564281
20147	Citgo	3(X)4 Sulfolane B-201 Furnace	2.90E04	2.86163169446899E04	1E1423767279
20149	Citgo	Vacuum Furnace B-201	2.02E03	2.03234150839926E03	1E9533822736
20150	Citgo	Vacuum Furnace B-2A	7.92E04	7.82533247748206E04	1E1153111450
20151	Citgo	Vacuum Furnace B-1	1.01E03	9.61409799854461E04	1E5431873695
20152	Citgo	3(I-D)3 Vacuum Furnace B-1 #2	1.01E03	9.61409799854461E04	1E5431873695
20153	Citgo	Coker 1 Furnace B-101	2.25E03	2.18587067047767E03	1E2903634683
20154	Citgo	Coker 1 Furnace B-201	2.42E03	2.35131933462144E03	1E2956850289
20155	Citgo	BLCOH Stabilizer Reboiler, B-101	4.00E04	3.8092318370717E04	1E05054225789
20156	Citgo	Feed Prep Furnace B-101 Stack 1	1.64E03	1.55480542853091E03	1E5214702431
20157	Citgo	FEED PRED B-101 HEATER, STACK #2	1.64E03	1.55480542853091E03	1E5214702431
20158	Citgo	SRF Furnace B-5	8.27E04	8.1128459397149E04	1E01904687135
20162	Citgo	3(XVIII-A)4 B-Reformer B-403, 404, 405 Furnaces	1.14E03	1.1992787942613E03	1E94970592878



20168	Citgo	C Topper Furnace B-1C	2.54E03	2.48213963369438E03	ED2136892889
20169	Citgo	C Topper Furnace B-2C	2.06E03	2.07960483265330E03	ED9069122640
20170	Citgo	BLCOH Reactor Charge Heater, B-3	2.99E04	2.86723932493427E04	ED4292843354
20171	Citgo	3(X)6 A-Reformer B-102, 103, 104, 105, 106 Furnaces	3.14E04	2.98873261775241E04	ED5203095364
20173	Citgo	Coker II B-201 Furnace	6.77E04	6.61864206245617E04	ED2320196497
20174	Citgo	Coker II B-202 Furnace	6.64E04	6.54347988713275E04	ED1479358948
20175	Citgo	3(XXVIII)1 Unicracker B-1,2,3,4,5 Furnaces	7.83E04	1.96906132723310E03	ED9753035756
20176	Citgo	3(XXII)1 C-Reformer B-501,502,506 Furnaces	2.84E04	3.06962361414602E04	ED2402586311
20177	Citgo	3(XXII)2 C-Reformer B-503,504,505 Furnaces	1.46E03	1.71545447324460E03	ED5363964481
20178	Citgo	Cat Feed Hydrotreater Recycle Hydrogen Furnace, B-101	1.92E03	1.81625982536187E03	ED5685598456
20179	Citgo	Cat Feed Hydrotreater Fractionator Feed Heater, B-102	5.36E04	5.06206057319885E04	ED5984421262
20180	Citgo	Furnace B-101	8.86E04	8.60661688228385E04	ED2956108538
20181	Citgo	Furnace B-102	4.31E04	4.18059459538983E04	ED3085494973
20182	Citgo	Reboiler B-103	5.08E04	4.92469913418623E04	ED3136364972
20183	Citgo	Furnace B-201	5.26E04	5.10634543268581E04	ED2912292896
20184	Citgo	Furnace B-202	4.95E04	4.80224887901755E04	ED3019016216
20185	Citgo	Reboiler B-203	5.61E04	5.43826051478009E04	ED3100249483
20186	Citgo	3(XXX)2 Mixed Xylenes B-1001 Furnace	7.17E04	6.96513673031345E04	ED2912350545
20187	Citgo	CV-1 B101A	2.32E03	2.2555994819329E03	ED03036843351
20188	Citgo	CV-1 B101B	2.28E03	2.20775917059081E03	ED3078525229
20189	Citgo	CV-1 B102A	3.75E03	3.63488753858991E03	ED3136632862
20190	Citgo	CV-1 B102B	4.23E03	4.09643906785344E03	ED3163585525
201912	Citgo	A Cat - Wet Gas Scrubber	3.43E03	3.35232685583876E03	ED2319353188



				04	04	
2013	13	Citgo	B Cat - Wet Gas Scrubber	8.36E-04	8.12353932619548E-04	8.102853210709
2013	14	Citgo	C Cat - Wet Gas Scrubber	1.29E-03	1.26254871148193E-03	1.102227914774
2013	17	Rain	Kiln Stack	4.13E-01	0.84718666187087E-01	0.348767131891
2013	18	Rain	WHB/Baghouse Stack	7.90E-01	0.39866676568667E-01	7.198054592047
2013	85	LA Pigment	SPRAY DRYER DUST COLLECTOR F603-A	3.30E-04	3.36651524354608E-04	3.197969347996
2013	86	LA Pigment	SPRAY DRYER DUST COLLECTOR F603-B	2.62E-04	2.67893109741700E-04	2.197670848760
2013	87	LA Pigment	UTILITY BOILER D841-1X (ROUTINE EMISSIONS)	1.02E-03	1.13979856111752E-03	1.189895376628
2013	88	LA Pigment	PROCESS OFF-GAS INCINERATOR STACK	1.30E-01	0.12641197537553E-01	1.02753129162
2013	89	LA Pigment	UTILITY BOILER D841-2X (ROUTINE EMISSIONS)	1.01E-03	1.05308674643106E-03	1.195835868404

Feel free to contact me and we can set up a call to discuss if needed.

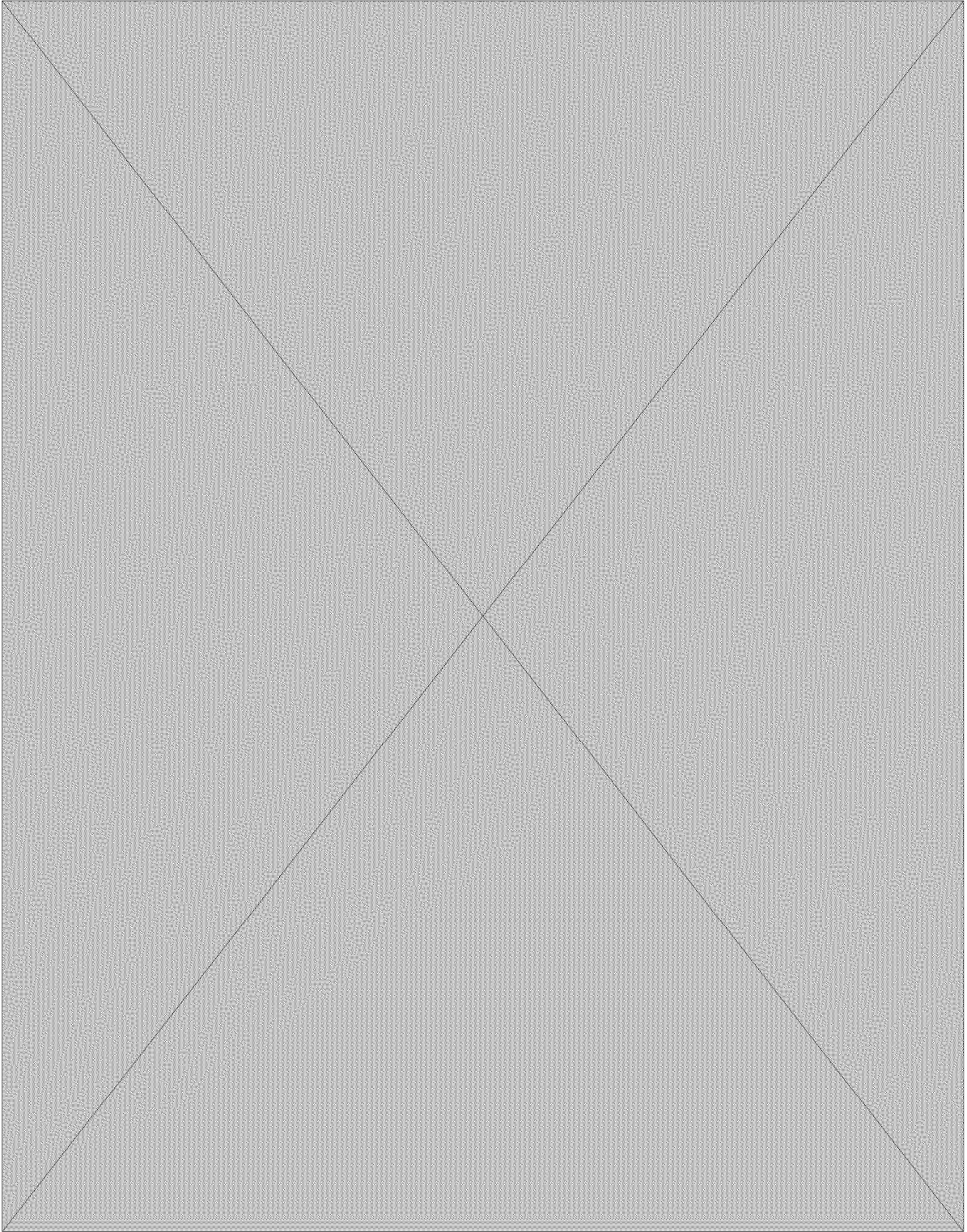
-Erik

Erik Snyder

Lead Regional Air Quality Modeler  
EPA Region 6  
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FROM August 2016 DRAFT Modeling TAD (available <https://www.epa.gov/so2-pollution/technical-assistance-documents-implementing-2010-sulfur-dioxide-standard>)











**To:** Imhoff, Robert[imhoff.robort@epa.gov]; Vivian Aucoin[Vivian.Aucoin@LA.GOV]  
**Cc:** Donaldson, Guy[Donaldson.Guy@epa.gov]; Huser, Jennifer[Huser.Jennifer@epa.gov]; Snyder, Erik[snyder.erik@epa.gov]; Medina, Dayana[Medina.Dayana@epa.gov]; Grady, James[Grady.James@epa.gov]; Verhalen, Frances[verhalen.frances@epa.gov]  
**From:** Vennetta Hayes  
**Sent:** Wed 1/4/2017 2:52:18 PM  
**Subject:** RE: Status of Louisiana DRR SO2 designation demonstrations

The St. Mary sources will not have limits in place as that are all in negotiations except Cabot. We were not proposing to use limits there. All other info you have is correct. The sites were operating on January 1.

Sent via the Samsung Galaxy S® 5 ACTIVE™, an AT&T 4G LTE smartphone

----- Original message -----

**From:** "Imhoff, Robert" <imhoff.robort@epa.gov>  
**Date:** 1/4/17 8:35 AM (GMT-06:00)  
**To:** Vennetta Hayes <Vennetta.Hayes@LA.GOV>, Vivian Aucoin <Vivian.Aucoin@LA.GOV>  
**Cc:** "Donaldson, Guy" <Donaldson.Guy@epa.gov>, "Huser, Jennifer" <Huser.Jennifer@epa.gov>, "Snyder, Erik" <snyder.erik@epa.gov>, "Medina, Dayana" <Medina.Dayana@epa.gov>, "Grady, James" <Grady.James@epa.gov>, "Verhalen, Frances" <verhalen.frances@epa.gov>  
**Subject:** Status of Louisiana DRR SO2 designation demonstrations

Vivian and Vennetta,

I'm checking in to report what we believe is the current status of the demonstration of attainment status for the Louisiana DRR sources. Would you please look over the status and let us know if there are any corrections? We classified the sources according to the currently indicated pathway rather than that declared back in July 2016. There are a couple of instances indicated where we've asked for clarification from HQ.

## Limits

### St. Mary Parish

From Vennetta's 12/12/16 email we gather that the following facilities are proposed to take a limit below 2,000 tpy.

- Orion Engineered Carbons LLC - Ivanhoe Carbon Black Plant



- Columbia Chemicals Co. - North Bend Plant

- Cabot Corp. - Canal Plant (a limit is now in place by consent decree, do we have documentation?)

Based on the 12/12 email it doesn't sound like they are now proposing to model these facilities as was initially declared but rather to take a limit. If so, this would be a change in path for all three with two not yet having a negotiated limit. According to the DRR the state must submit to EPA documentation showing that the emission limit is effective and federally enforceable no later than January 13, 2017. We've asked OGC what our course will be if you are not able to submit the documentation by that date. Also, we will probably need you to send a letter notifying us of the change in pathway – we'll let you know ASAP.

### **AA Sulfuric Corp – Sulfuric Acid Plant**

From an 11/2/16 phone call with Vennetta, I understand that this plant is shut down. We just need to make sure that we have the proper documentation.

## **Modeling**

### **Calcasieu**

It is proposed to use modeling for designation of Rain and Nelson in Calcasieu Parish while monitoring is to be used for Reynolds. We received a letter yesterday notifying us of the change in pathway. The use of this strategy has been previously referred to OAQPS but we've not heard back from them.

### **Cabot Ville Platte**

Modeling protocol received and reviewed – we requested more details, recommended the use of a closer SO2 monitor for background determination, and that the receptors be extended to 20 km. According to Vennetta's 12/12/16 email LDEQ is modeling the source but has not yet finished.

### **CLECO Brame Energy Center**

The modeling report has been received and reviewed. Our follow up questions have been addressed. This one is complete with only the required DRR follow up to make sure that



circumstances, e.g. an increase in emissions, have not changed in the future in such a way that concentrations would be expected to rise.

## **Big Cajun II**

A draft modeling report has been submitted to LDEQ and forwarded to Region 6 for review. Region 6 has asked for more detail on how the determination of no-impact-above-the-SIL on modeled nonattainment receptors was made. We may have more comments this week on the modeling report when review is finished; we'll let you know if we do or do not. Also note that in our review of the modeling protocol we requested a report in the first quarter of 2017 that a test of the methodology used for estimating hourly emissions for unit 1 for 2013-2015 be conducted and tested against the actual 2016 hourly emissions. This is to demonstrate that the method is conservative.

## **Monitoring**

Region 6 has approved the monitor siting for the following sources:

- ☐☐☐☐☐☐☐ Rain CII Carbon LLC - Norco Coke Plant
- ☐☐☐☐☐☐☐ Oxbow Calcining LLC - Baton Rouge Calcined Coke Plant
- ☐☐☐☐☐☐☐ Rain CII Carbon LLC - Gramercy Coke Plant
- ☐☐☐☐☐☐☐ Reynolds Metals Co. - Lake Charles Carbon Co.
- ☐☐☐☐☐☐☐ Entergy Gulf States LA LLC - Nelson Electric Generating Plant
- ☐☐☐☐☐☐☐ Sid Richardson Carbon Co. -Addis Plant

Can you please affirm that each of these was operational on Jan 1 2017?

Best regards,

Bob

**From:** Imhoff, Robert

**Sent:** Monday, December 12, 2016 10:59 AM



**To:** 'Vennetta Hayes' <[Vennetta.Hayes@LA.GOV](mailto:Vennetta.Hayes@LA.GOV)>; Vivian Aucoin <[Vivian.Aucoin@LA.GOV](mailto:Vivian.Aucoin@LA.GOV)>

**Cc:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>; Huser, Jennifer <[huser.jennifer@epa.gov](mailto:huser.jennifer@epa.gov)>; Donaldson, Guy <[Donaldson.Guy@epa.gov](mailto:Donaldson.Guy@epa.gov)>; James Grady (<[Grady.James@epa.gov](mailto:Grady.James@epa.gov)>)

**Subject:** RE: Request for status of SO2 Modeling Reports

Vennetta,

Thanks for getting back to me so quickly! The Brame contour plot clearly shows the concentrations decreasing with distance and that the location of the highest model design value has been identified. That is very helpful.

I'm personally not certain on the timing of when limits-taken have to be in place or declared under the SO2 consent decree to meet the DRR requirements. I know that the St. Mary Parish facilities are not identified in our tables as meeting the DRR requirements by taking a limit, so there may need to be a clarification.

Let us know there's anything we can do to assist you in the Cabot Ville Platte modeling.

Best regards,

Bob

**From:** Vennetta Hayes [<mailto:Vennetta.Hayes@LA.GOV>]

**Sent:** Monday, December 12, 2016 10:08 AM

**To:** Imhoff, Robert <[imhoff.robert@epa.gov](mailto:imhoff.robert@epa.gov)>; Vivian Aucoin <[Vivian.Aucoin@LA.GOV](mailto:Vivian.Aucoin@LA.GOV)>

**Cc:** Snyder, Erik <[snyder.erik@epa.gov](mailto:snyder.erik@epa.gov)>; Huser, Jennifer <[Huser.Jennifer@epa.gov](mailto:Huser.Jennifer@epa.gov)>; Donaldson, Guy <[Donaldson.Guy@epa.gov](mailto:Donaldson.Guy@epa.gov)>

**Subject:** RE: Request for status of SO2 Modeling Reports

Brame has provided the contour plot and update which I have attached. Big Cajun provided the updated protocol attached on Friday.



St. Mary Parish facilities are negotiating consent decrees and have not provided information with the exception of Cabot Canal which has limits that place them below the 2000 tpy by consent decree.

I am still working on refined modeling for Cabot Ville Platte, but so far do not have a model demonstrating attainment.

Vennetta T. Hayes  
LDEQ Air Permits  
219-3412

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**From:** Imhoff, Robert [imhoff.robert@epa.gov]  
**Sent:** Monday, December 12, 2016 9:49 AM  
**To:** Vivian Aucoin; Vennetta Hayes  
**Cc:** Snyder, Erik; Huser, Jennifer; Donaldson, Guy  
**Subject:** Request for status of SO2 Modeling Reports

Hi Vennetta,

Since we are now only a little more than one month away from the deadline for modeling reports for the SO2 standard, it would be good to touch base on the status. The table below gives what I've got right now, let me know of any updates or changes that are needed. Note that these do not include the proposed modeling for Rain and Nelson in Calcasieu which is under discussion.

Best regards,

Bob

Facility	Designation Modeling Protocol		Protocol Review		Modeling Report		Modeling Report Review	
	Date		Date		Date		Date	
	Protocol		Review		Status		Review	
	Received / Expected	Received / Expected	Completed / Started	Comments / Problems	(Go / No) / Requested	Received / Expected	Completed / Started	Comments / Problems



Plant

Center

to 20km

LA

CFR



Louisiana Generating LLC - Big Cajun II Power Plant	7/12/2016Yes	REI 10/17/2016	modeling report from Brame that indicated attainment. We recommended receptor out to 20km Need to revise method adjusting emissions for U1. Recommend using a closer monitor.	Revised date	Part 75 for all Quality Assura and data reportin
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